MARCH 8, 1958
VOL. 154—NO. 10

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

INTREPID OPERATOR

Sally Joy, an operator for the Au Sable Forks Telephone Co., braves the snow drifts and below zero temperatures in Upstate New York as she and her Tennessee walking horse make their way to work. See page 44 for story.

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years and years of operation without replacement. XY Dial Systems are the only step-by-step equipment with this feature that assures you of extra reliability and service economy. It pays to "go XY Dial" when you convert your exchange to dial.

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PERFECTION

to meet every specification

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to match every decor

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Another magic word has touched the homes of the happy folk who strive and are entitled to live comfortably. The telephone today—the Kellogg K-500—serves double duty, brings functional color to the modern home.

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FLASHES AND PLUGS

THWARTS CUPID. According to the United Press Sid Hughes of suburban Ilford near London, England left his telephone receiver off the hook on Valentine Day.

Even before the holiday, Mr. Hughes was deluged by telephone calls from young lovers asking for "good luck" wishes. His telephone number is Valentine 1958.

•

WIRES GONE WILD. From Ft. Campbell, Ky., comes the story about the good job Army helicopters did of stringing telephone wire to troops on maneuvers there. Good job up to a point that is.

After landing, one of the choppers took off again—the pilot under the impression that his wire stringing mechanism had been disconnected.

It wasn't. In no time at all he had dropped thousands of feet of wire over the countryside.

It went across pastures, woods, streams and roads, and across a 66,000 volt power line, putting out lights in much of the military post and in surrounding areas.

•

DIAL "M" FOR MUSIC. A new "song-a-day" service by telephone proved so popular in Paris that it jammed a local exchange, hindering the completion of other and more business-like calls in that area.

The service called "Tele-Chanson" (tele-song) could be obtained by dialing a number and it was operated by a private agency with official cooperation. The music had to be temporarily discontinued until a larger new switchboard could be installed for the benefit of music lovers.

•

RENOWNED TELEPHONE NUMBER. An Associated Press release reports on the visit of John D. Yoon, a Korean telephone engineer, to Gov. George M. Leader of Pennsylvania. Yoon is studying U. S. methods.

"Why did you come to Pennsylvania to make your observations?" the governor asked.

"I heard the song 'Pennsylvania 6-5000' so much in Seoul that I wanted to see what Pennsylvania actually was like," Yoon answered.

•

JUST CHECKING. A Norwalk, O., telephone subscriber recently put through a call requesting to be connected with a veterinarian in a nearby town.

"Is this a personal call?" inquired the operator.

"Of course not," replied the caller indignantly. "I'm perfectly fine. It's my dog that's sick."

CHANGE OF ADDRESS

Please notify your local postmaster and the Circulation Dept. of TELEPHONY of change of address. Change cannot be made without the old as well as the new address. Allow three weeks for change of address to become effective.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

March 8, 1958

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equipment for

INFORMATION RECORDS

Speed up your central information switchboard records by making *all* of your telephone listings conveniently available to every information operator.

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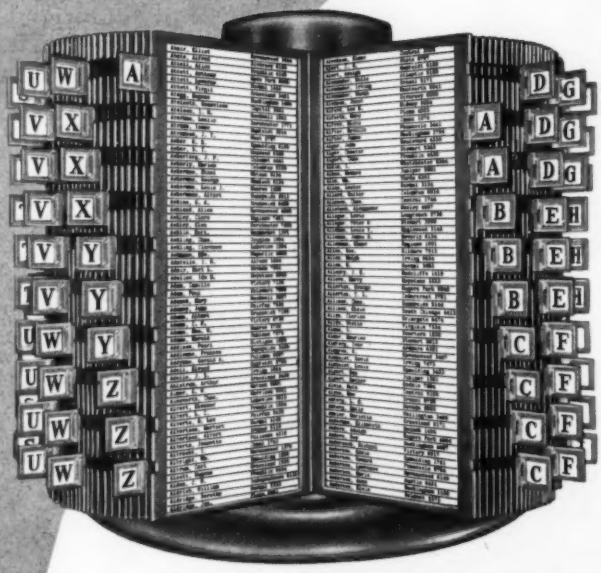
Regardless of the type of switchboard you use or the number of subscribers you have, there is an Acme Time-Saving FLEXOLINE modern, hi-speed reference unit that will exactly meet your individual purpose.



Revolving stands provide compactness and great capacity . . . in single or double tier units they hold from 7,000 to 147,600 listings. May be used on desk, switchboard or mounted on pedestals.

Desk stands, individual units with up to 32,800 listings capacity or in banks of a number of stands, for greater capacity.

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T3-8-58

Please send us illustrated booklet

☐ #1088 on Acme Switchboard Keyshelf Units ☐ #975 on Acme Flexoline

☐ Have representative call. Date_____ Time_____

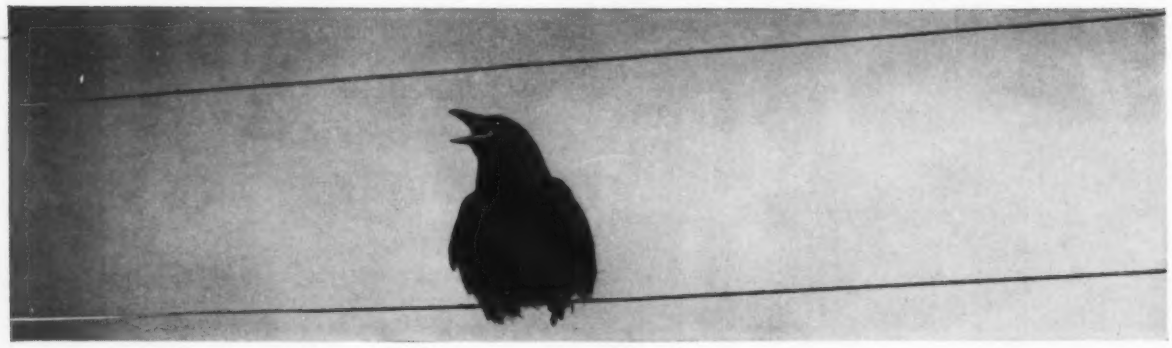
☐ We are interested in Acme Visible equipment for_____ (KIND OF RECORD) records.

COMPANY_____ ATTENTION_____

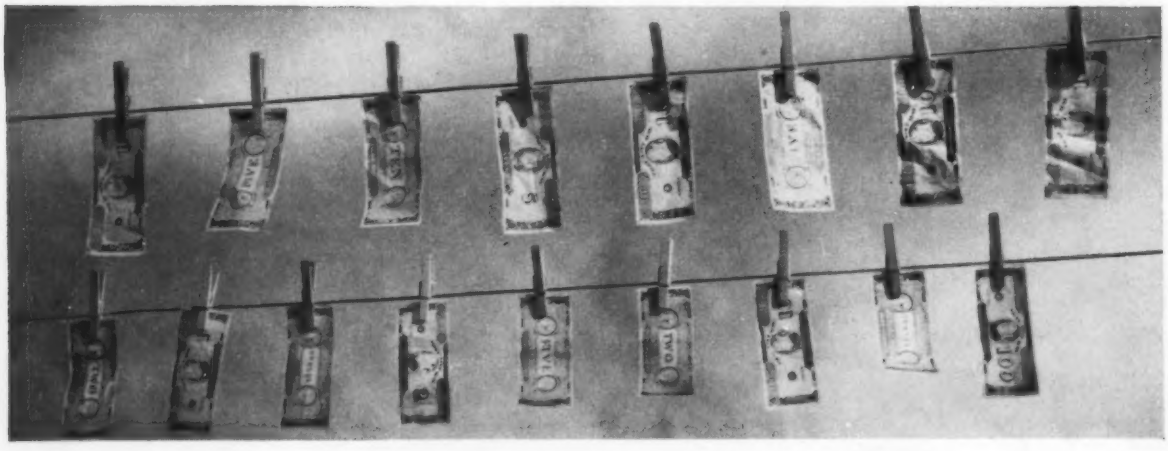
ADDRESS_____

CITY_____ ZONE_____ STATE_____

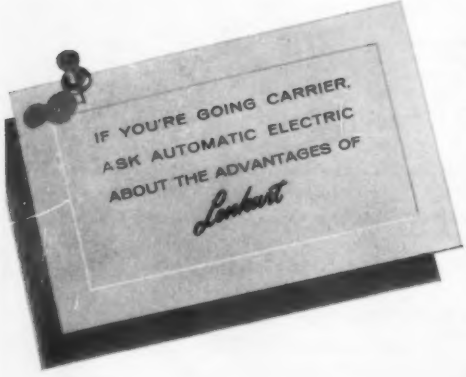
Your present wires



can carry more toll revenue



with LENKURT carrier



Before you go to all the expense of laying cable or planting poles to add new toll circuits, we suggest you get the Lenkurt story from an Automatic Electric engineer. Because with Lenkurt Carrier you can add dozens of profitable new toll circuits, probably without stringing wire or disturbing a square inch of real estate.

OTHER LENKURT ADVANTAGES: You get your toll circuits into money-making operation much faster. Initial cost is less, in most instances. You're ready to expand—quickly and at low cost—anytime in the future.

As the distributor of Lenkurt equipment, Automatic Electric offers "carrier without complications"—engineered, furnished and installed.

Whether you're thinking about expanding right now or at some future date, one of our carrier engineers can give you the whole story. Why not drop us a line right now? Automatic Electric Sales Corporation, Northlake, Illinois. *In Canada:* Automatic Electric Sales (Canada) Ltd., Toronto, Ontario. *Offices in principal cities.*

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One of America's great communications systems

GENERAL SYSTEM

NEW, SHORT *Koiled Kords**

CUT HANDSET LOSSES . . . on Coin Collector Telephones

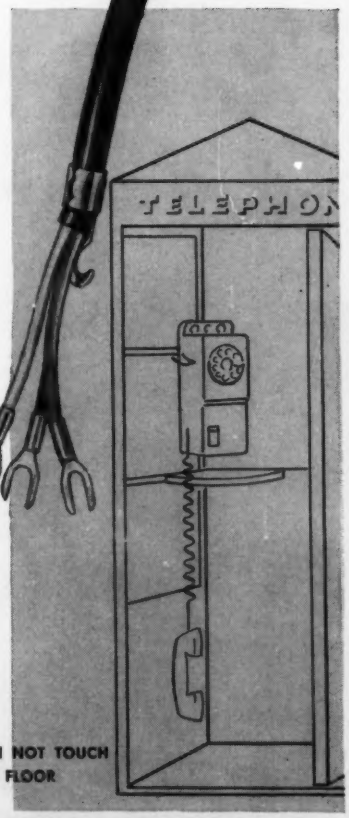
ACTUAL SIZE

These new short KOILED KORDS retractile cords allow sufficient length for use in telephone booths but are short enough to prevent the handset from hitting the floor if dropped.

Figure your past losses from broken handsets and you'll see how much these new short KOILED KORDS can save you.

These new short KOILED KORDS are available for Automatic Electric, Kellogg, Stromberg-Carlson and Western Electric handsets.

KOILED KORDS, the original retractile cords, are the result of 17 years of research, development and use.



CAN NOT TOUCH THE FLOOR

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Koiled Kords INCORPORATED BOX K NEW HAVEN 14 CONN.

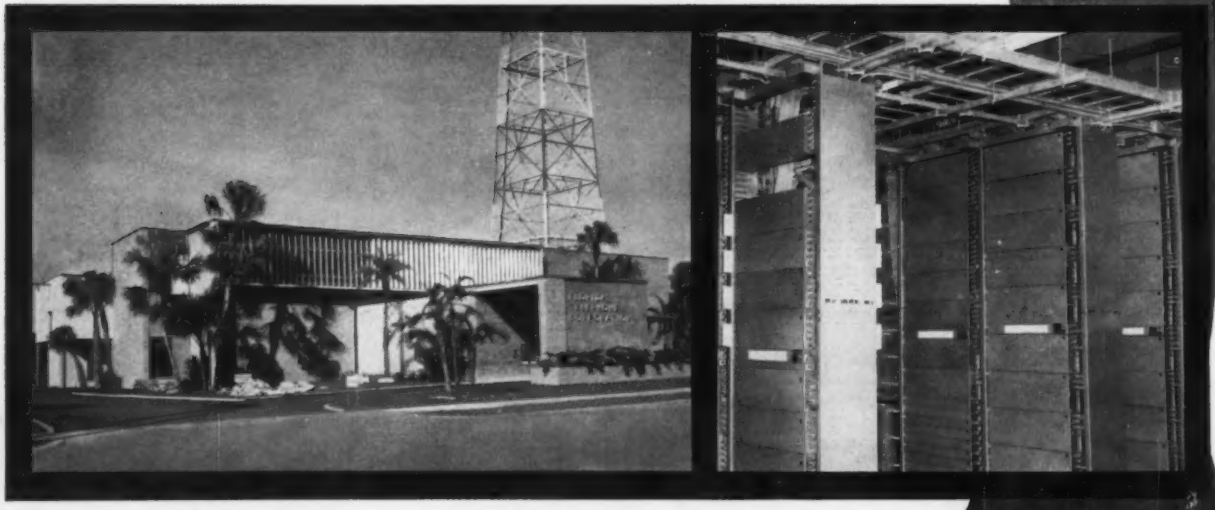
LEESBURG CUTS OVER LARGE TOLL CENTER AND LOCAL EXCHANGE TO **NORTH BY-PATH CROSSBAR**

The new telephone building in Leesburg, Florida, houses the 3,000 line exchange and the toll center for nine Florida Telephone Corporation exchanges.

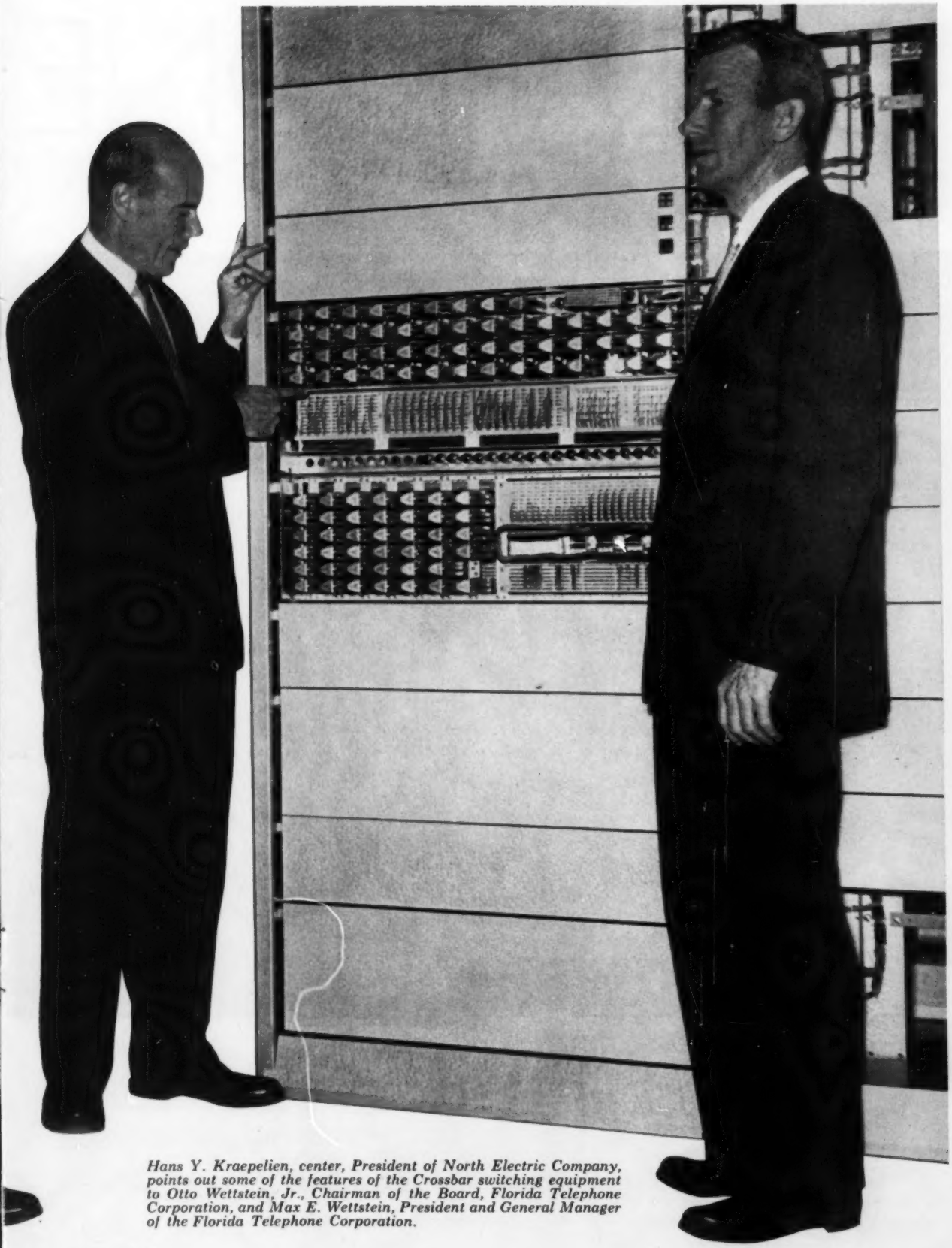
Toll traffic through this exchange reaches as high as 130,000 toll calls per month over 245 trunks.

Leesburg has converted to North Crossbar, the most advanced switching equipment available to the Independent Telephone Industry, because North Crossbar was determined as the only switching equipment that could fully meet all the demands that would be placed upon it.

NORTH ELECTRIC COMPANY
553 SOUTH MARKET STREET · GALION, OHIO

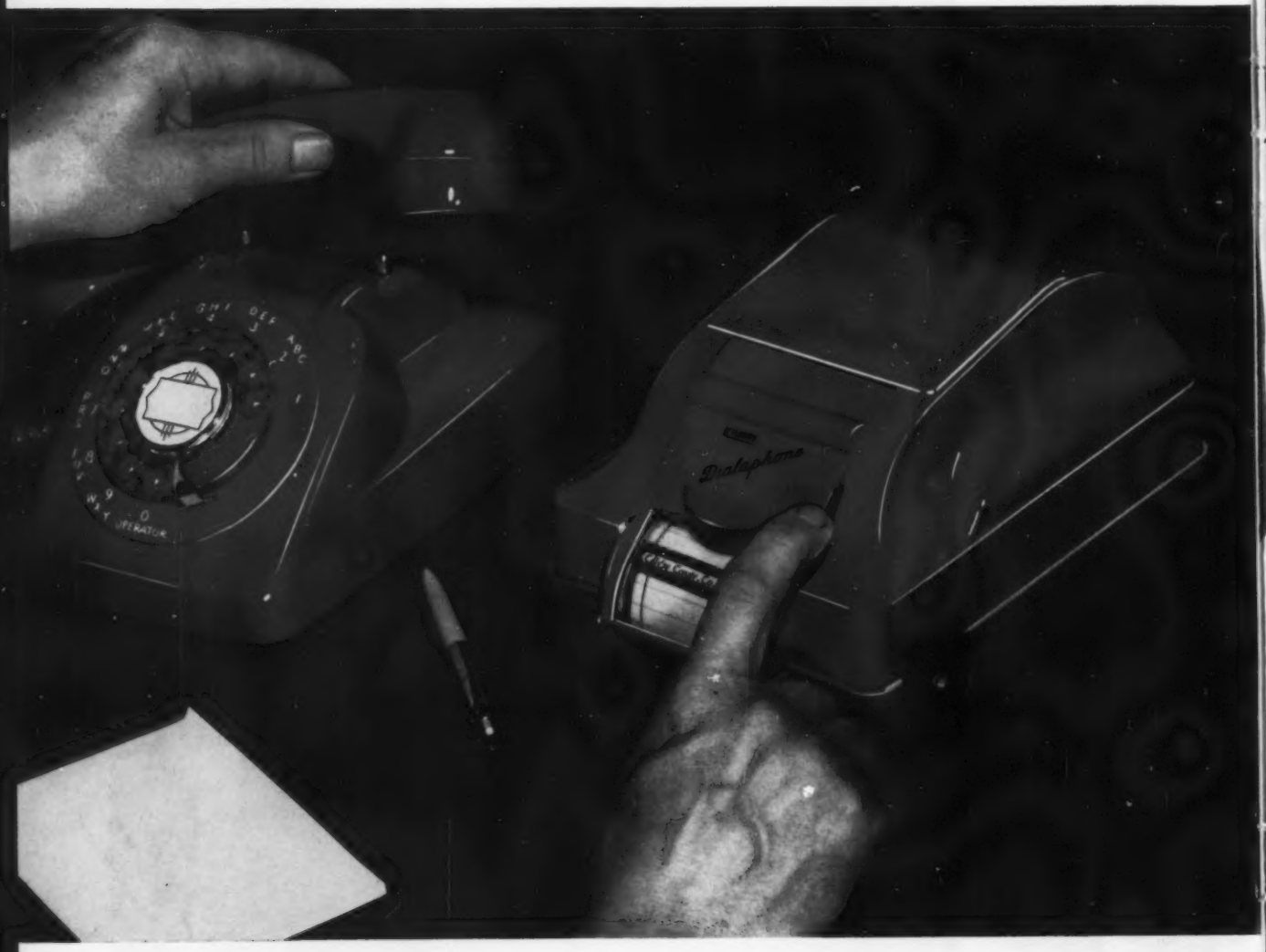


The new central office building of the Leesburg exchange is as modern and efficient as the equipment that makes it one of the country's most progressive operating companies.



Hans Y. Kraepelien, center, President of North Electric Company, points out some of the features of the Crossbar switching equipment to Otto Wettstein, Jr., Chairman of the Board, Florida Telephone Corporation, and Max E. Wettstein, President and General Manager of the Florida Telephone Corporation.

DIALAPHONE



gives your subscribers push-button dialing!

With *Dialaphone* your subscriber makes calls faster, easier and more accurately. There's no hunting through a bulky directory. An indexed Directory Tape provides space for 850 separate listings. The subscriber simply turns a crank which spins the tape; when the name of the desired party appears in the View Frame, he presses the Starter Key and the call is completed *automatically*. The Directory Tape is prepared from a list which is supplied by the subscriber. Additional listings may be added to the tape at any time.

EQUIPPED FOR DDD

Because of the growing number of DDD (Direct Distance Dialing) installations using the nation-wide numbering plan, Dialaphone provides for up to 14 digits.

CHOICE OF 10 ATTRACTIVE COLORS!

We are now supplying the Dialaphone in all of our attractive telephone colors: Gardenia White, Camellia Pink, Forget-Me-Not Blue, Sunlight Yellow, Classic Ivory, Sand Beige, Garnet Red, Dawn Grey, Jade Green and Turquoise. We'll be glad to send you literature which gives further details. Call your Automatic representative or your nearest A. E. Sales Corporation warehouse.

STARTER KEY
After party has been selected —and dial tone heard—depress to start automatic dialing of call.

VIEW FRAME
Alphabetically indexed to provide quick finding of party.

HAND CRANK
Rotates Directory Tape through all five directory sections—Emergency, General, Classified, Long Distance and Frequent Use.

Automatic's 5 friendly warehouses:

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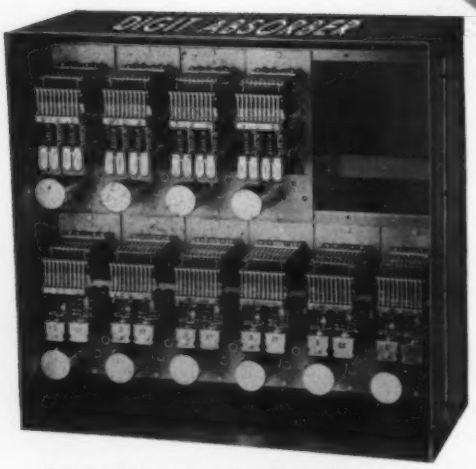
GENERAL TELEPHONE SYSTEM

Can your Switchboard handle

2-5 DISTANT DIALING?



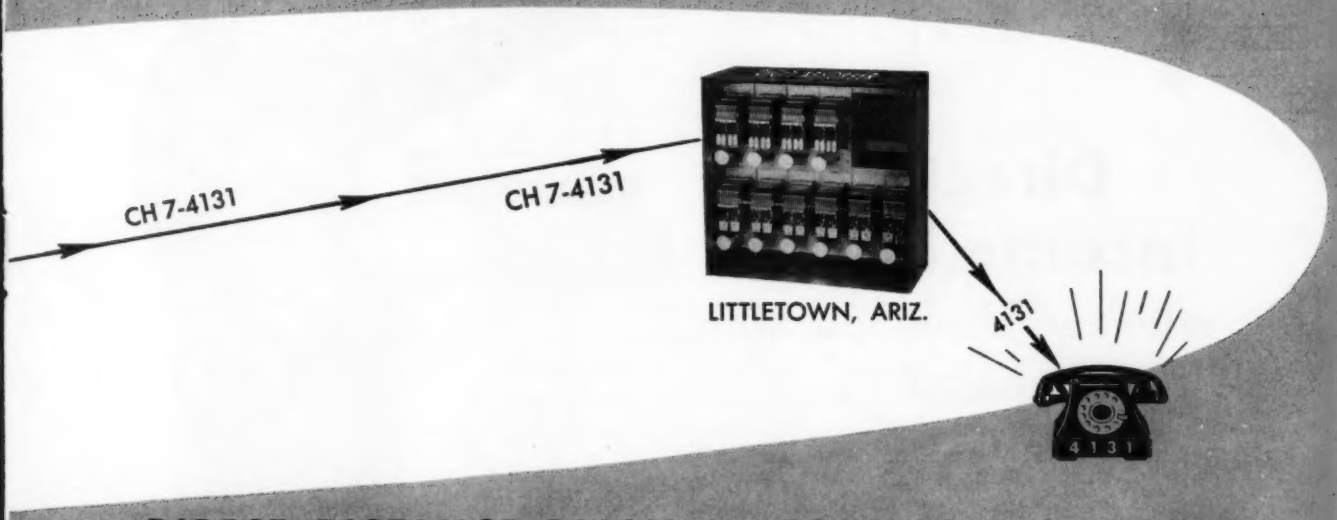
Typical Relay Case for Digit Absorber.

The Universal Digit Absorber employs simple circuity with a magnetic impulse counter, together with other standard relay apparatus of recognized manufacture.

Other UNIVERSAL Telephone Equipment:
Code-to-Selective RINGING CONVERTER
COMPUTER INTERCEPT

INDEPENDENT

It can with a **UNIVERSAL DIGIT ABSORBER***



DIRECT DISTANCE DIALING REQUIRES A 2-5 CODE

The nationwide dialing plans for operator and direct distance dialing require that all stations be recognized by a 2-5 code. Few dial switchboards of earlier design have provisions for adding digit absorbing features economically. The Universal Digit Absorber fills this need easily and at nominal cost. Installation requires very little time.

The ever-increasing requirements of Extended Scope Dialing on a universal numbering arrangement are easily handled by the Universal Digit Absorber. The Digit Absorber is a factory assembled, fully-wired, applique unit that can be added to any existing dial switchboard to pad in three digits of exchange code (ABX) or four digits in the case of a small digit dial unit.

There are two types of Universal Digit Absorbers, depending on the complexity of the exchange codes assigned:

*19-S unit will handle exchange codes, as illustrated by AB-X, where the "X" digit is not a duplicate of the "A" or "B" digit.

*19-L unit is required where the "X" digit is a repeat of either the "A" or "B" digit.

In addition, Universal offers a Trunk Digit Register unit which can be applied to "Trunk on Line" dial units where five or more digits are required to be delivered to a 3 or a 4 digit tributary exchange.

*Pat. Pend.

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165 PROSPECT STREET PASSAIC, N. J.

Mail this coupon to the nearest address.

Gentlemen: I am interested in your Universal *Digit Absorber* for 2-5 Numbering.

Name_____

Position_____

Firm_____

Address_____

City_____ State_____

T-3-8

Directory income booms

with our "Revenue Men" behind it

OUR DIRECTORY "Revenue Men"—working from 32 strategically located sales offices—providing the Independent Telephone Industry with a flexible and highly skilled telephone directory organization, are equipped to render a Complete and Quality Directory Service.

These specialists, through the use of up-to-the-minute knowledge of the market—proper sales training—imagination—ideas—leadership—and hard work, produce results which more than measure up to accepted directory revenue standards.

Yes, the "Yellow Pages" revenues, in the more than 800 directories we now produce for large and small Independent Telephone Companies, prove the statement "DIRECTORY INCOME BOOMS WITH OUR 'REVENUE MEN' BEHIND IT."

Write or phone our office nearest you for our Complete Directory Service Plan.

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IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR

David A. Hamil, REA Administrator, advances plan to transfer burden of REA loans from government to private sources, although the proposed revolving fund would retain some money available at 2 per cent interest. Progress on telephone excise tax cuts consists of two bills to cut them in half, also the sponsorship of five liberal Democratic Senators.

REA Administrator Hamil has come up with a brand new program for easing the Rural Electrification Administration out of the cheap loan business. It should be said at the outset that there seems little hope of final action on this plan at this session of Congress. But it is an attractive plan and it has some long-range possibilities. So, any publicity or analysis on the subject at this time would still be highly educational. It might be more than that. It might provide a foundation for real progress in the future.

With this thought in mind, let us consider the salient features of this administration proposal to shift the burden of REA loans from government to private sources. At the outset, it should be kept in mind that this plan would apply to both rural electrification and rural telephone loans. It would apply to loans not only to commercial companies but also cooperatives. But it would *not* affect the terms and conditions of the 3.3 billion dollars of REA loans already on the books.

A third point to keep in mind is that the program would not mean the end of all 2 per cent loans. This was made clear in a letter to Congress from the Secretary of Agriculture stating that "loans made from funds borrowed from the Treasury, as made available by the Congress in appropriation acts, will bear a 2 per cent interest rate unless a different rate is prescribed by the Congress."

Further comment by REA Administrator Hamil made this observation: "The Rural Electrification Act now consists of two titles, one providing for electrification loans and general administration of the programs, the other providing for rural telephone loans. It is proposed to add two new titles which would furnish a basis for private financing for both programs."

Under the proposed legislation, a revolving fund would be established with the Secretary of Agriculture as managing trustee. The fund would include congressional appropriations made available to REA, amounts repaid by borrowers, and funds raised through the sale of revenue bonds. The proposed legislation would authorize issuance of revenue bonds up to 50 per cent of the assets of the revolving fund.

The present statutory 2 per cent interest rate would apply only to loans made from funds provided by Congress. Other loans at higher rates of interest might be made by the Secretary if he felt the circumstances of a particular loan application warranted a higher rate.

The clear objective of this arrangement would appear to be the creation of transitional financing machinery for shifting future loans from the present subnormal interest rate and partially subsidized basis to a sounder economic basis which would pay its own way. Part of the idea seems to be that it might furnish an incentive for future Congresses to appropriate less funds for outright 2 per cent loans, as the higher rate form of financing takes over more of the load.

Aside from the revolving fund, the proposed legislation would provide for government insurance of loans obtained from private sources. It recommends an appropriation of one million dollars to protect private lenders against all losses. The interest rate on such loans would have to be approved by the Secretary of the Treasury, and the amount of loans so guaranteed by the government would be limited to 150 million dollars in fiscal 1959.

As another loan source, the Secretary of Agriculture would be given authority to subordinate the prior lien of the United States on any government loan to present or future REA borrowers. This means the federal government would agree to be set aside as first mortgagor under existing REA loans in order to allow borrowers to obtain additional funds from other sources more easily.

The administration's proposals were sent to Congress last month, but as of this writing no sponsor had been found. The recommendations, all of which were implied in the President's Budget message in January, are not expected to attract widespread support.

Charges that the administration would like to end all dependence of REA cooperatives on federal funds have already been heard in Congress. The general unpopularity of the administration's entire farm program, when coupled with the popular political standing REA has always enjoyed in Congress, does not lend much hope that these proposals will get very far at this session of Congress.

Here is the text of the proposed "Revolving Fund" plan as proposed by REA Administrator Hamil:

"Title III, as proposed, provides a means for obtaining funds for the rural electrification and rural telephone programs from private lenders.

"Section 301 would establish a revolving fund from which REA loans would be made. The fund would consist of:

"(1) all past and future obligations of borrowers;

"(2) the undisbursed balances of outstanding loans;

"(3) all collections of principal and interest accruing on borrowers' obligations made or obtained under Titles I and II;

"(4) all loan funds received from the Treasury under Titles I and II and appropriations for administrative expenses; and

"(5) the proceeds of private financing operations conducted under this title.

"As of Dec. 13, 1957, if this title had then been in effect, the revolving fund would have amounted to approximately 3.8 billion dollars excluding item (5).

"The revolving fund is available for loans under Title I and II in amounts as authorized by Congress after payments of interest and principal on obligations to private lenders and to the Treasury, and administrative expenses.

"Section 302 authorizes the issuance of obligations to private lenders for the raising of moneys to go into the revolving fund, up to 50 per cent of the fund's assets.

"The interest rates on these obligations which may be either short- or long-term cannot be predicted. They should compare favorably with rates paid by the Treasury on comparable maturities.

"The revolving fund, including obligations issued to private lenders, should adequately meet financial requirements of borrowers for the foreseeable future."

Bill to Cut Excises

A good start was made on a measure to cut telephone excises when the liberal wing of the Democratic party in the Senate joined up on a bill introduced last month. There were two bills in fact (S. 3263 and S. 3264). And they would amend the Internal Revenue Code so as to cut federal excise taxes on transportation (passenger fares and freight) and communications (telephone monthly bills and long-distance calls and telegrams). On the theory that half a loaf is better than nothing, this is good news for the telephone industry. If enacted it would mean that the present 10 per cent tax on monthly bills would be cut to 5 per cent. Likewise the 10 per cent tax on long-distance calls would be cut to 5 per cent.

Too much hope cannot be raised at this troublesome time that the two bills will be enacted at this session of Congress. But they will probably get further along than otherwise would have been the case because of the character of the sponsorship. This may surprise some readers. The five U. S. Senators are Carroll (Colo.), Douglas (Ill.), Humphrey (Minn.), Morse (Ore.), Neuberger (Ore.), and Proxmire (Wis.).

Obviously, these Senators have not been among the more enthusiastic admirers of the telephone industry, as such. But it is significant that these same Senators—some of whom have been called anti-business or even anti-utility—are evidently impressed with an argument which the telephone industry has long tried to make clear about this question of reducing excise taxes.

The argument is that an excise tax on telephone service is not a tax on the telephone company. It is a tax on the telephone subscribers.

It is not a tax on the company's operations. It is a tax on the subscriber's *use* of the service. In that respect it is a "sales tax," so to speak.

REA Approves 3 Loans Totaling $774,000

The Rural Electrification Administration approved $774,000 in rural telephone loans for three borrowers in Alabama, Kansas, and North Dakota during the week of Feb. 10 the U. S. Department of Agriculture announced. The loans will finance initial telephone service for about 500 farm families and other rural subscribers and improved service for nearly 700 existing rural subscribers.

The following loans were approved:

Northwest Mutual Aid Telephone Corp., Columbus, N. D., (mailing address, Ray, N. D.); $272,000; Feb. 11.

The borrower plans to use these funds to improve service for 268 existing subscribers and to furnish initial service for 88 rural families. Present subscribers now receive magneto service from the Farmers Mutual Telephone Co., Powers Lake, the facilities of which the borrower proposes to acquire. A new automatic central office is scheduled at Powers Lake.

REA loans, totaling $2,439,000 to date will enable the borrower to furnish new and improved service to 3,276 rural subscribers. The completed system will consist of 13 exchanges of which seven are in operation and will provide dial service to about 1,300 North Dakota farms and ranches.

Wayne Johnson is president and Arthur S. Johnson is manager of Northwest Mutual Aid Telephone Corp.

•

Peoples Telephone Co., Collinsville, Ala.; $351,000; Feb. 14.

The borrower plans to use these funds to furnish new and improved service to 547 rural subscribers. Currently, 176 subscribers are being served through the Cedar Bluff common battery and the Gaylesville automatic exchanges of the Cedar Bluff Telephone Co., which the borrower expects to acquire.

New construction scheduled includes new automatic central offices at Cedar Bluff and Gaylesville. Initial service will be furnished to 371 rural families in an enlarged service area.

REA loans totaling $1,522,000 to date, will enable the borrower to provide dial service for 3,039 rural subscribers. Six of eight proposed exchanges are now providing dial service to about 2,050 rural subscribers.

M. G. Weaver is president and manager of Peoples Telephone Co.

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Harper County Rural Telephone Association, Anthony, Kan.; $151,000; Feb. 14.

The loan funds will finance improved service for 253 present subscribers and initial service for 41 farm families. Present subscribers now receive magneto service from the Mayfield Telephone Co. and the Mutual Telephone Exchange Co., Bluff City. The borrower plans to acquire the Mayfield company and access rights to the Mutual company.

New construction scheduled includes automatic central offices at Bluff City and Mayfield.

REA loans totaling $771,000 to date, will enable the borrower to provide new and improved service to 1,454 rural subscribers. Of seven proposed exchange areas, four are in operation and furnish dial service to approximately 600 farm families and other rural subscribers.

Dean Hughes is president and James Salter is manager of the Harper County Rural Telephone Association.

It is just as much of a burden on the mass population as any other kind of a sales tax, whether it is paid at the grocery story or some other retail establishment or paid via the telephone bill.

Probably Dr. Gallup's interesting poll of some months ago showing that the telephone excise tax was the most unpopular of all excise taxes had something to do with this shifting political wind from the left. In other words, it is not a case of Senator Morse, et al., loving the telephone companies more. It seems to be a case of doing something for the greatest number of voters. After all, everybody who is anybody uses the telephone.

In this connection, the recent annual report of the American Telephone & Telegraph Co. reminds us again of the terrific burden which telephone taxes places on the back of the average subscriber. According to this 1957 annual report, Bell System taxes amounted to $1,784,000,000 or an average of $2.92 a month per telephone in 1957. Of this, 1.2 billion dollars was in taxes on telephone company operations. The remaining amount, exceeding a half billion dollars, was in federal excise taxes paid directly by Bell System customers. Independent telephone companies doubtless had proportionate taxes to report for that year.

Going back to the year 1956, on which statistics are more complete, this writer is informed that the average telephone subscriber in the United States laid out the sum of $49.25 that year for telephone company taxes of all kinds. He paid these taxes, to a large extent, without knowing it—on his telephone bill.

Of that amount, more than $14 a year was paid by each subscriber (on the average) in excise taxes alone. *That means over $14 each is being collected from over 62 million telephone subscribers in the United States over a 12-month period!*

This total tax burden of nearly $50 a year, which each telephone subscriber lays out on the average, is a tidy bit of money even in these days of inflation. What could the average telephone subscriber do with that $50 if he did not have to pay it out on his telephone bill for taxes of all kinds? A monthly payment on the family automobile; a down payment on some much needed furniture; or house repairs; or some heavy-duty appliances. Fifty dollars would take a lot of pressure off of some pressing back bills—doctors' bills, mortgage or trust payments, charge accounts. Fifty dollars would make a big hole in real estate tax bills or income tax liability. Fifty dollars would take care (or go a long way towards) overhauling the family car.

Yes we can all think of a lot of places for $50 in hand. But it is not in hand. Each one of us paid it out on our telephone bills throughout the year in telephone company operating and excise taxes.

This is not to suggest that the telephone companies ought to be tax-free or tax-favored. Telephone companies naturally expect that their operations must bear their fair share of the cost of government, just like any other business. It is the *extra* load which causes the complaint. And the complaint is made on behalf of the subscribers who really have to shoulder that load. Evidently, some of the U. S. Senators are discovering that there may be some political appeal in helping ease this load on 62 million subscribers in the United States.

The comparison of $50 made above is simply a form of illustration which might impress telephone subscribers with the fact that they are putting their hands in their pockets every year for some real money to take care of taxes levied on them through their telephone bills. Much of this is necessary and inescapable. But some of it may not be necessary. And some of it is an unfair and discriminatory tax on the telephone subscriber as such.

We may not realize the gravity of these taxes when they are slipped into our monthly bills and paid out in $5.00 or $10 amounts. It is only when, at the end of the year, we are suddenly brought face to face with the fact that we might have had a couple of new tires or a new suit out of the tax segment of our telephone bills that we appreciate the telephone company's role as a tax collector in disguise.

Switching Excises to the States

Representative Fountain (D., N. C.) is chairman of a House Government Operations subcommittee working on the recent suggestion that collection (or at least the proceeds) of telephone excise taxes should be turned over, in part, to the state governments.

Telephone companies are generally opposed to this because they know that once the state legislatures get hold of this excellent source of tax revenue they will be very loath to let go of it. Thus, telephone excise taxes, originally imposed during a temporary economic emergency, and then greatly expanded (during World War II) as a temporary war emergency measure, would become a *permanent* part of our tax structure. Indeed, state legislatures

(Please turn to page 50)

1958 Convention Calendar

Association	*Date*	*City*	*Hotel*
Iowa	April 8 and 9	Des Moines	Fort Des Moines
Ohio	April 14, 15 and 16	Columbus	Deshler-Hilton
North Dakota	April 14 and 15	Fargo	Gardner
Nebraska	April 22 and 23	Omaha	Paxton
Indiana	May 7 and 8	Indianapolis	Claypool
American Railroads (Communications Section)	May 13, 14 and 15	Kansas City, Mo.	Muehlebach
Wisconsin	May 14 and 15	Milwaukee	Plankinton House
Illinois	May 21 and 22	Peoria	Pere Marquette
Kansas-Missouri*	May 26 and 27	Kansas City	Town House
Pennsylvania	May 26, 27 and 28	Bedford	Bedford Springs
Maine-New Hampshire-Vermont*	June 3, 4 and 5	Rockland, Maine	Samoset
California	June 4, 5 and 6	San Francisco	Sheraton-Palace
New York	June 16, 17 and 18	Schroon Lake	Scaroon Manor
Oregon-Washington*	June 19, 20 and 21	Portland, Ore.	Multnomah
Alaska	Aug. 11, 12, 13	Juneau	Baranof
Michigan	Sept. 9, 10 and 11	Grand Rapids	Pantlind
Arkansas	Sept. 15 and 16	Hot Springs	(Unannounced)
Rocky Mountain	Sept. 17, 18 and 19	Salt Lake City	Utah
West Virginia	Sept. 24 and 25	Davis	Blackwater Lodge
North Carolina	Oct. 6 and 7	Pinehurst	Carolina
USITA Annual convention	Oct. 13, 14 and 15	Chicago	Conrad Hilton
Virginia	Oct. 30 and 31	Roanoke	Roanoke
Oklahoma	Nov. 5 and 6	Oklahoma City	Huckins

*Joint Convention

Economic Selection Studies

By JOHN D. DRESSER

THIS IS the first of a series of seven articles on a subject in which plant management and supervisory personnel of all telephone companies have a deep interest. Development of plans to bring about economical and practical designing of plant is an ever-present objective and these articles will discuss various items to be considered in such planning. We feel we are fortunate in being able to make arrangements for the presentation of the articles to our readers—The Editors.

1.000. Introduction

1.100. In any industry, one of the essential jobs is to determine the most economical of several plans by which something may be done, some product produced or supplied, or some service rendered. Many projects have more than one possible way of being completed. If it is necessary to increase the size of a plant due to an increase in business, one solution might involve building the new portion to meet the ultimate requirements. Another might consist of a moderate addition now, with subsequent additions later. Other conditions being equal, the decision of which method to use should rest with the most economical plan.

1.200. Of the many activities of an engineer, one of the most important is the development of the plans for doing an economical job. This may involve designs for the judicious spending of company money which, although not actually handled by the engineer, may be spent by the company in constructing plant in accordance with the plans produced by the engineer. It might also be that the engineer is called upon to express judgment or pass upon the plans produced by others. If the final plans do not call for an economical design of plant, the company may have to pay more for results achieved than should have been expended.

Quite often management must make a decision as to which one of several possible courses to follow. A number of items may have to be considered. Some of these can be presented in concrete figures, others can be expressed only as ideas or conditions, i.e., intangibles. Of the concrete items, the economy in plain dollars and cents of one plan over another plan is one of the important things to be considered before a decision can be made. Since the relative economy of the plans must be considered along with the intangibles, it is often the case that the most economical plan is not always the plan selected to be built.

1.300. The economy of a plan may have to be balanced against such intangibles as:

(a) The effect of the plan on the quality and dependability of the product or service.

(b) The effect of new money requirements both now and later. Immediate large investments are at a distinct disadvantage compared to those of smaller amounts. Although the plan requiring the larger investment may be indicated as the more economical over a period of years, yet the greater amount of new capital required now may overbalance the desirable feature of ultimate economy.

(c) Adaptability of the plan to existing conditions.

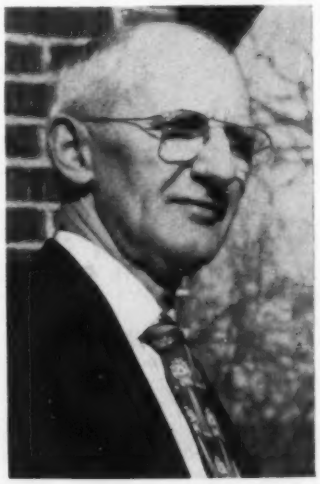
(d) Doubt as to the realization of assumptions of growth, labor costs, material costs, etc. If the plan depends upon a long period of time for its economy, its likelihood of accuracy is decreased by the possibility of changes in these factors which may occur during the long period. The farther into the future the predictions are to carry, the less reliable they are apt to be.

(e) Results of the plan upon future flexibility.

(f) Availability and ease of handling material. If the required material components are in short supply, or are difficult and expensive to handle, it may be these intangibles will carry such weight that a different plan will be followed.

(g) Effect upon employe and public relations.

About the Author



Following graduation from Purdue University in 1924, Mr. Dresser had wide experience in the Plant Engineering Department of the Michigan Bell Telephone Co., being district plant engineer of the downtown Detroit area before the depression. At the beginning of the war in Europe, he was district plant engineer of the heavy manufacturing, steel mill, and chemical plant section and the rapidly growing downriver residential district. During the war, and since that time, Mr. Dresser has been in the General Engineering Department in Detroit, engaged in outside plant fundamental planning and in economic study work. He has taught the "Economic Selection Study Course," which begins in this issue, to more than 600 telephone people in the last few years.

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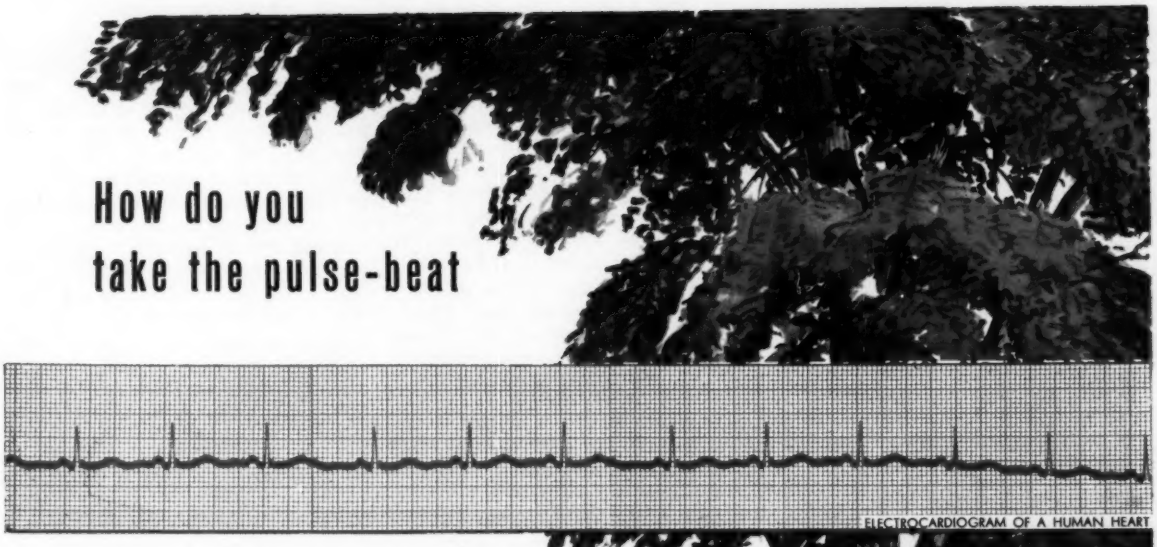

How do you take the pulse-beat

ELECTROCARDIOGRAM OF A HUMAN HEART

# of an ailing tree?...

Trees do not have heart attacks or a pulse affected by illness or exertion. But they do have a vital circulatory system and ailments with symptoms that are just as revealing to the skilled Bartlett Tree Expert as an irregular heartbeat to the physician. Proper diagnosis in either case often goes beyond the mere acceptance of symptoms. It may call for laboratory tests and scientific skills to verify conditions and determine causes. Only after careful analysis can proper treatment be prescribed.

Scientific tree care is available to you through your local Bartlett representative. These highly skilled technicians, with local knowledge, plus the backing of the Bartlett Tree Research Laboratories with its staff of nationally known scientists, are not only capable of accurate diagnosis but have the ability and equipment to carry the treatment to a successful conclusion.

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(h) Ability to obtain the necessary new money required for the job.

So, then, in order to design the most economical plan, or to balance the effect of the most economical plan against the intangibles, methods of determining the economy of the various plans under consideration must be at hand. There is a common belief that the plan requiring the smallest investment is the most economical. This plan may be the cheapest to build or to develop, but it may require large annual maintenance expenses, operating cost, or heavy depreciation payments after it is built, which would offset the immediate saving in investment.

In other words, "It is not the original cost, it is the upkeep," to use an old-time phrase. To determine this most economical plan, recourse is had to studies which use the annual charges (i.e., the cost or expenses per year), which would be in effect after the project is built, as a basis for comparing the economies of the plans.

These annual charges not only give a measure of the relative amounts of money required to build each of the plans under consideration, but they also include the effects of a number of items not reflected in just a comparison of first costs. Some of these items are:

(a) Rents paid.
(b) Unusual maintenance expense.
(c) Operating expenses.
(d) Rearrangement expenses.
(e) Future additions of plant.
(f) Removals of plant.

2.000. Definitions.

2.100. *Investments* are moneys spent for property, whereas *expenses* are moneys paid from income for some service, for a change or alteration in existing property, for taxes, repairs, etc.

In the telephone industry, property might take the form of real estate, central office equipment, outside plant, an automobile, or other tangible or intangible assets. Investments do not include money spent for repair parts, nor for small items required to rearrange or change some existing property. Investments are sometimes referred to as first costs, which may be used interchangeably in study work. They should always include the cost of material, its transportation charges to the installation location, the installation charges, storage, etc., to be paid up to the time the item is to be put into service.

When it is necessary to determine the first cost of existing plant for Economic Selection Studies, it is desirable, of course, to use the actual figures incurred by the job which built that plant. Very often, this is almost impossible, as these figures cannot be found. The next best figure to use is the average cost of all remaining items of this particular type of plant still in use. In some companies, this is known as the retirement unit cost. Therefore, in Economic Selection Studies, the investment of proposed items should be the estimated cost at the time of installation. For existing plant, the estimated investment should be based upon the retirement unit cost, unless the actual installation cost is at hand.

Some industries are able to use part of their net incomes for plant expansion, i.e., for investment to enlarge the business. Others, however, must depend upon the sale of additional bonds or stock to obtain investment money. These latter industries usually fall into the class of public utilities whose incomes depend upon rates for their services being set by regulatory bodies of the state or federal governments. The service rates, in most cases, barely permit payment of expenses and a modest return upon the investment, so that any funds required for plant additions must be obtained from the sale of securities to the general public.

Gross additions, as far as study work is concerned, are investments to be made in proposed plant.

Plant displaced is the first cost of existing items to be removed.

Net additions are the gross additions less the plant displaced. Net additions represent the change in investment shown on the company's books as a result of building new and removing existing plant.

2.200. In study work, *non-recurring expenses* are expenses (not investments) which do not occur every consecutive year. It may be necessary to pay these expenses only once, or they may have to be paid every other year, or at irregular intervals. If an expense is payable every year, then it is not a none-recurring expense, but an annual charge. This type of expense is discussed in the next paragraph.

2.300. *Annual charges*, or annual costs, are those sums of money which must be assigned or paid every year to defray the costs of plant existence and operation. Annual charges are of two kinds, viz., operating expenses and fixed charges.

2.310. *Operating Expenses* are the annual costs incurred in running the business, i.e., they result only from putting the plant to use. When business is good, the operating expenses may increase; and, conversely, they may decrease when business is poor.

2.311. Operating expenses:

(a) Maintenance.
(b) Traffic expense.
(c) Commercial expense.
(d) Administrative expense.
(e) General expense.

2.312. *Maintenance* is the cost of keeping plant in good working condition. It includes the cost of repair parts and of making the repairs to the various items of equipment and the expenses of routine upkeep. Also charged to maintenance is the cost of rearranging or changing a piece of equipment and the cost of any minor plant items required for doing this work. To avoid obstructing the entrance of a new driveway, a pole may have to be moved. The cost of shifting the pole is a maintenance charge. If a piece of equipment must be relocated in a central office, this cost also represents a maintenance charge. It can be seen that maintenance seems to have little or nothing to do with the first cost of a piece of equipment. For this reason, maintenance is usually expressed, in this study work, as a dollar and cents charge per unit of plant, preferably not as a per cent of the first cost.

Some of the representative items which compose the maintenance expense are listed below:

(a) Repair labor and repair parts.
(b) Rearrangement labor and small parts required by the rearrangements.
(c) Testing labor to discover trouble or trouble location.
(d) Portion of supervision labor applicable to maintenance activities.
(e) Motor vehicle expense when the vehicle is used for maintenance purposes.
(f) Social security taxes and company payments into pension and relief funds on the labor portion of the above items.
(g) Payments to contractors or others to perform maintenance services. This would include payments to municipalities, counties, and states for trimming trees.

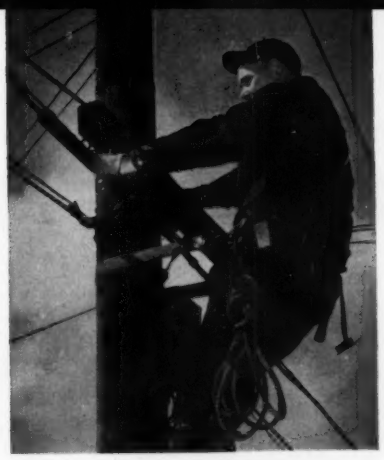
In cases where the fundamental data of the study indicate the number of units of plant or material to be used, if the plant were constructed according to one of the plans of the study, the total maintenance is determined by applying the dollar and cents charge per unit to the number of units. However, it may happen that basic data for the study are given in terms of dollars to be invested in each type of plant without the number of units or items being presented. Under this condition, the total maintenance can be indicated only as a percentage of the investment or first cost.

2.313. In telephone work, traffic expense takes into account the wages paid the operating forces and their supervisors, the expenses incurred by lunch and rest rooms, operators' schools, etc. As the traffic expenses are usually not

(Please turn to page 46)

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR



IN A PAPER presented during the winter general meeting of the American Institute of Electrical Engineers in New York City, W. K. MacAdam of the American Telephone & Telegraph Co., stated that the quality of telephone service has undergone continuous improvement until now customers on long distance calls may converse as if they were only 6 feet apart. Thirty-five years ago, the estimated distance was 70 to 80 feet, he said.

Furthermore. Mr. MacAdam stated that improved volume is a central problem in telephone transmission, and programs are under way in many locations to bring about progressively better hearing conditions for customers. He emphasized the need for remaining constantly sensitive to customer desires, continually improving quality of telephone transmission and maintaining flexibility in present facility designs to care for future changes.

He stressed that "with service the main telephone product, its quality control is not a luxury but a business necessity" and that "the closer one gets to the customer in examining the quality of service, the better is the measure of the job being done and the work that lies ahead."

With this in mind, the evaluation of service performance and customer desires has been carried out more or less continuously in the telephone industry since its early days. Recent subjective tests of receiving volume with a variety of typical listeners have added to the knowledge, particularly with regard to higher levels.

"Such information," he said, "permits studying reactions to volumes ranging from excessive to inadequate. With this spread in data, the communications product can be analyzed from the viewpoint of preference rather than tolerance."

This continuous knowledge of customer preference, he indicated, forms the "backbone of design objectives," allows for a "prudent program for updating existing plant to modern requirements" and is a deterrent to "latching onto a physical measurement of noise, volume and distortion, and holding it sacred and unchanged throughout the years."

•

We have in general always admired the safety practices of telephone companies, but at times we wonder at the chances they take.

Recently, we noted a cable splicer's trailer, with ladder and platform stacked on top, parked on a side street near a busy thoroughfare. The first night a red lantern burned brightly. Then, no doubt the oil in the lantern was all used and the light went out. For three nights the trailer remained parked without a warning light or even reflectors. This could have resulted in a serious accident and possibly an expensive lawsuit for the company. Perhaps this was due to the failure of one individual and was not the company's policy. However, the fault of the individual might also be traced to an inadequate training policy of the company.

•

Out in Redding, Cal., the Pacific Telephone & Telegraph Co. has installed a special telephone system for the police department. Police officers in the station can now call the men on the beat, and a patrolman can call headquarters for assistance. The desk sergeant only has to push a button and a red lamp on the call box lights up to attract the beat man's attention. The patrolman, in turn, goes to the box, unlocks it, picks up the handset and immediately is connected with headquarters.

•

Records recently compiled indicate that Americans took nearly 50 million trips by air in 1957. Moreover, these statistics indicate that the air travelers were less likely to be killed by accidents than their fellow Americans on highways. Reports from CAB and the AAA show that:

Four air crashes killed 67 passengers on the nation's scheduled airlines last year. Unscheduled airlines had no fatalities. Automobile accidents killed an estimated 38,700 people.

For the sixth year, airlines had a fatality rate of less than one for every 100 million passenger-miles traveled. The 1957 rate for air travel inside the United States was 0.1 per 100 million passenger-miles. Automobile fatalities for the same period work out to nearly six per million passenger miles.

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We are advised that instead of crying over spilt milk, go milk another cow.

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We have long held the opinion that telephone wall plugs and jacks have not been used to full advantage in the Independent field.

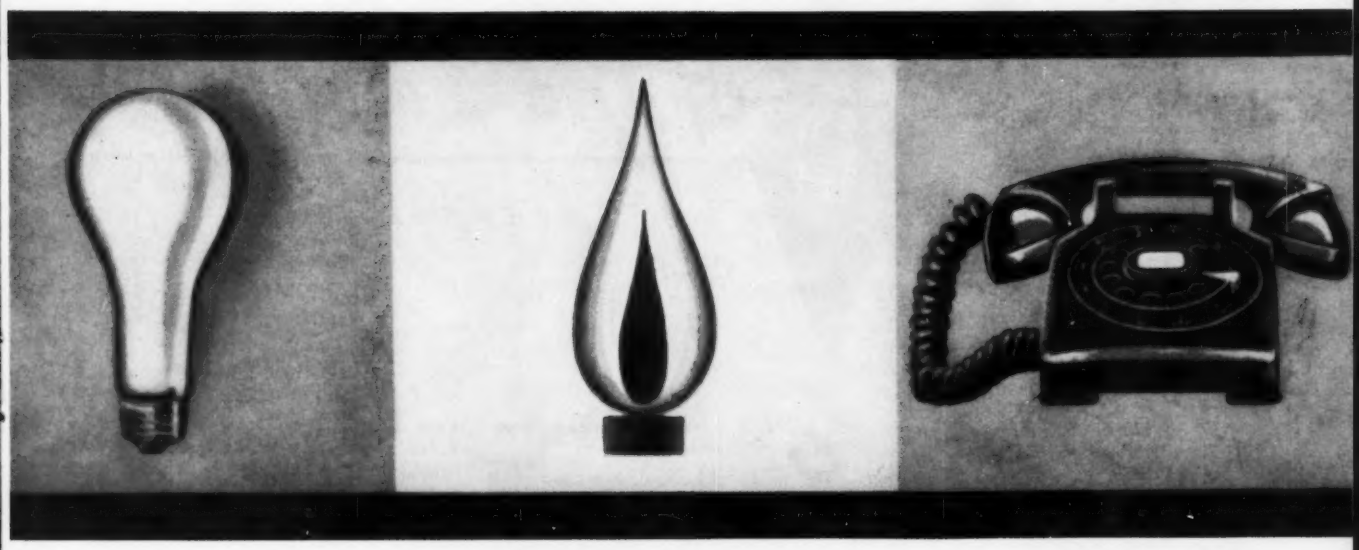
Plugs properly placed prove to be a real convenience in any home as the telephones may be moved quickly to various locations, as required. Flush and non-flush jacks and brackets for mounting in a conduit box are now being supplied by Independent manufacturers at a reasonable cost. Plug, jack bodies, and wall plates are made of high-impact styrene and are available in brown or ivory. We suggest that a more extensive use of these plugs and jacks for the Independent field be considered.

•

Bill Gold, of the Washington (D. C.) *Post*, tells about the young mother who taught her little daughter to dial her grandmother. All went well until the little girl first encountered the busy tone. She dropped the handset and called to her mother: "Come quick and listen. I dialed sputnik all by myself."

Of these four household utilities, the telephone is the only one subject to excise taxes.

OUR CUSTOMERS' TELEPHONE BILLS COULD BE 10% LOWER IF...



DO your friends and neighbors ever complain to you about the size of their telephone bill?

If so, you can tell them that their telephone is still one of the biggest bargains in their family budget, that it has gone up in price less than most things they buy.

But you can also point out that their bill is *10 per cent higher than it would otherwise be, because of the federal excise tax.*

Telephone excise taxes were first levied during World War II to raise government revenues and to free circuits for war-essential calls. The tax was repealed in 1924. Then, in 1932, during the Depression, the tax was reintroduced, and 10 years later increased and broadened to meet the needs of World War II. Three years ago it was reduced, but today, 11 years after the end of the war, the tax is still on the books.

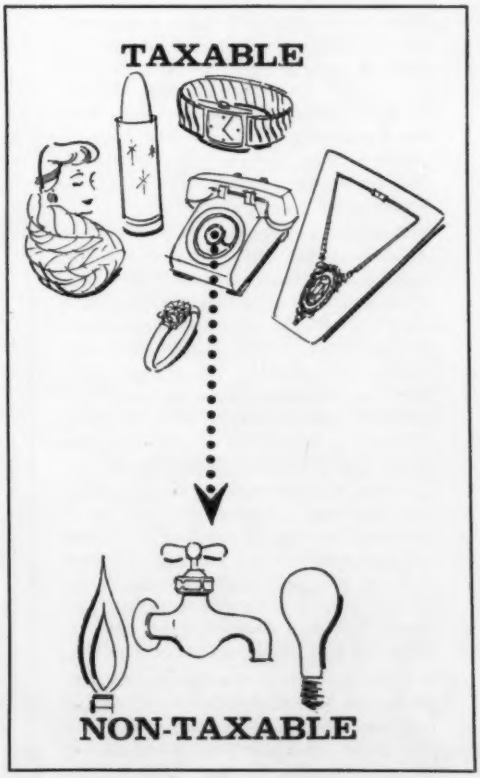
Excise taxes are usually applied to such luxury items as furs, jewelry and cosmetics. As a matter of policy, no *essential* service should be so taxed. And we're sure the public considers telephone service a necessity, not a luxury.

Telephone service is the only household utility subject to excise taxes today. There is no such tax on water, gas or electricity. Our customers, therefore, are asked to pay an unfair share of federal revenue.

The public carries a heavy burden of telephone taxes, with the excise tax added on top. In 1956, for example, the amount a Bell System customer paid for telephone service included, on the average, $49.25 for taxes. Of this amount, more than $14 was for federal excise taxes. To put it another way, out of every dollar the customer paid for service, 28 cents went for taxes.

Our customers stand to reap the benefits if the excise tax were repealed.

We know it costs money to run the country. But when the time comes that taxes can be reduced, we think the excise tax on telephone service should be among the first to get attention.—*Reprinted from The Chesapeake & Potomac Telephone Companies' employe magazine,* THE TRANSMITTER.



ABC of the Telephone

by Frank E. Lee

WHETHER or not necessity is the mother of invention is a question that can be debated whenever any new idea is discussed. Some people say the shortage of lead and rubber during World War II made the development of plastic insulated cable a priority necessity. This may or may not be true—however, the war may only have advanced the date that plastic cable was developed.

Practically all, if not all, of the war-born shortages have been eliminated, and in the process many wartime substitutes have gone by the boards. But not plastic insulated cable. Plastic cable is here to stay. In fact, with the continuing heavy demand for telephone service, there is little doubt that, war or no war, plastic cable would be available on the market today.

Lead cable, discussed in Section 9 of Part 83 of this ABC Series, was named from the lead outer sheath of the cable. Plastic cable was named from its plastic outer sheath. In many instances, plastic insulation is also used on each conductor. Technically, the plastic material used in these cables may be called polyethylene, polyvinyl chloride, thermoplastic, polyethylene thermoplastic resin, and numerous trade names.

Some manufacturers use polyethylene over the conductors as well as in the outer jacket. Other manufacturers use polyethylene to insulate the conductors and polyvinyl chloride in the sheath. Cables with plastic jackets and paper insulated conductors are also included in the plastic cable classification.

Plastics used in the manufacture of cable can be compounded to withstand bending, abrasion, moisture, and the effects of sunlight and chemicals in the air. In addition, these plastic compounds are not affected by extreme variations in temperature. In fact, plastic jackets have been subjected to bend tests at temperatures as low as —60° centigrade. This is equivalent to 75° below zero on a Fahrenheit thermometer.

The tough sheath of a plastic cable will withstand the normal wear and tear to which a cable is subjected in normal service. This includes mechanical stress and strain of handling and installation and the buffeting a cable receives from exposure to the elements after installation.

Plastic cable is light in weight. Actually it is about one-half the weight of an equivalent lead sheathed cable. This reduction in weight has a two-fold benefit. First, the cable is easy to handle and can be installed with lighter equipment. Second, the lighter cable can be suspended from a smaller suspension strand.

The fact that a plastic cable is lighter in weight than a lead cable does not mean that pole and suspension strand sizes can be cut in half. Part of the aerial cable load on a pole line is caused by the effect of wind blowing against the cable. Assume that the plastic and lead cables were the same diameter. Then the effect of a cross-wind is practically the same on both cables.

Plastic used on the individual cable conductors has excellent electrical and physical properties and provides a high insulation resistance. The mutual capacitance range of these cables is practically equivalent to that of dry paper. The effect of mutual capacitance of pairs of conductors in a cable was discussed in Parts 7 and 41 of the ABC series. Both of these sections are included in the reprint volumes of this series.

Moisture has little, if any, effect on the jacket and insulation materials

PART 83. OUTSIDE PLANT CONSTRUCTION—Section 10. Installation of new cable facilities—lead and plastic—continued.

Section 1. Planning of additions to outside plant (TELEPHONY, Nov. 17, 1956).

Section 2. Laying out the pole line, clearances to be maintained, and grading requirements (TELEPHONY, Nov. 24, 1956).

Section 3. Selection, treatment, handling, storage, and gaining of poles (TELEPHONY, Dec. 1, 1956).

Section 4. Items of power equipment used in pole line construction and maintenance. Also discussed depth poles are set in various types of soil (TELEPHONY, Dec. 8, 1956).

Section 5. Purpose of guy wires and factors involved in their proper placement (TELEPHONY, Feb. 16, 1957).

Section 6. Types of guy wires, how to determine guy loads, and the selection of guy strand (TELEPHONY, Feb. 23, 1957).

Section 7. Selection and installation of anchors (TELEPHONY, Apr. 27, 1957).

Section 8. Selection and installation of anchors—continued (TELEPHONY, May 4, 1957).

Section 9. Installation of new cable facilities—lead and plastic (TELEPHONY, Sept. 14, 1957).

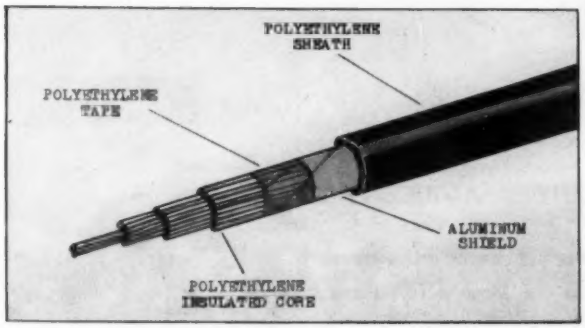


Fig. 1

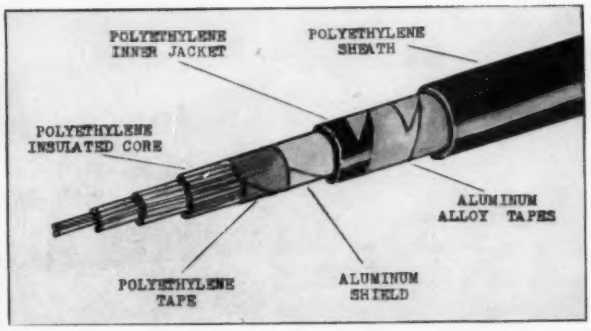


Fig. 2

used in plastic cable. Even if water should enter the cable sheath the conductors will not be in trouble. The plastic insulation on the wires will still provide high insulation resistance.

The plastic conductor insulation is not positive assurance that the cable will never be affected by moisture trouble. To conserve space in the cable, the plastic insulation is made as thin as possible. Occasionally a pin hole leak will occur in the insulation. As long as the sheath is intact the pin hole will not cause trouble. However, if moisture enters the cable the pin hole size leak will result in the same type of trouble as occurs in a wet paper lead cable.

A sheath break in a paper lead cable can be readily located. Moisture will cause shorts and grounds in the immediate vicinity of the break. The reason is that the paper insulation readily absorbs and draws the moisture into a large part of the cable core.

In a plastic cable, moisture entering a sheath break may follow the aluminum or steel shield before coming in contact with the conductors. As a result, the trouble indication may occur at a point up to 10 feet and possibly more, from the sheath break.

If the plastic cable has paper insulated conductors a sheath break would cause the same trouble as if the sheath were lead.

Construction of Plastic Cable

Conductors of plastic cable are stranded into concentric layers to form units. The units are cabled to form a core. This is the same procedure used with paper lead cable as discussed in Section 9 of Part 83. In smaller cables the pairs are stranded into concentric layers.

If the conductors are insulated with plastic, a spiral wrap of lapped polyethylene tape is applied over the cable core. Some manufacturers use laminated rubber and a polyester film tape instead of the polyethylene tape. The purpose of the tape is to provide high dielectric insulation between the shield and the core.

Next an aluminum shield is applied over the assembled pairs. Then a plastic sheath is placed over the completed cable, as illustrated in *Fig. 1.*

The insulation and jacket materials used in a plastic insulated cable are classified as non-hygroscopic. According to Webster's International Dictionary a hygroscopic material or substance will readily absorb and retain moisture. From this a non-hygroscopic material will not readily absorb and retain moisture. These materials also have a minimum water vapor transmission rate. For this reason, water does not tend to spread over a large area of the cable should a sheath break occur.

The aluminum shield, when properly grounded, protects the cable from damage by lightning and prevents low-frequency induction from adjacent power lines.

Plastic cable can also be used for direct earth burial installations. The make-up of a typical cable manufactured for this purpose, shown in *Fig. 2*, is as follows:

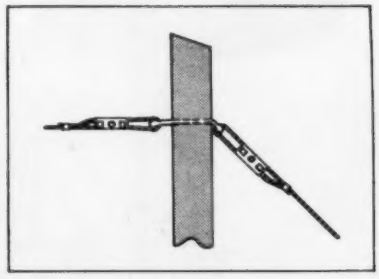


Fig. 4

(1) A spiral wrap of lapped polyethylene tape followed by an aluminum shield is placed over the cable core.

(2) An inner polyethylene jacket of high molecular weight is extruded over the wrapped core.

(3) Two layers of aluminum alloy tape are wrapped around the inner jacket.

(4) The outer jacket consists of a second layer of tough polyethylene.

The construction of a typical plastic cable with paper insulated conductors, illustrated in *Fig. 3*, is as follows:

(1) The paper insulated conductors are wrapped with a high dielectric strength paper core binder.

(2) A corrugated aluminum shield is placed over the wrapped cable core.

(3) A corrugated, coated steel tape with the overlap section continuously soldered is placed over the aluminum shield.

(4) Tough high molecular weight polyethylene is used for the outer jacket.

(Please turn to page 30)

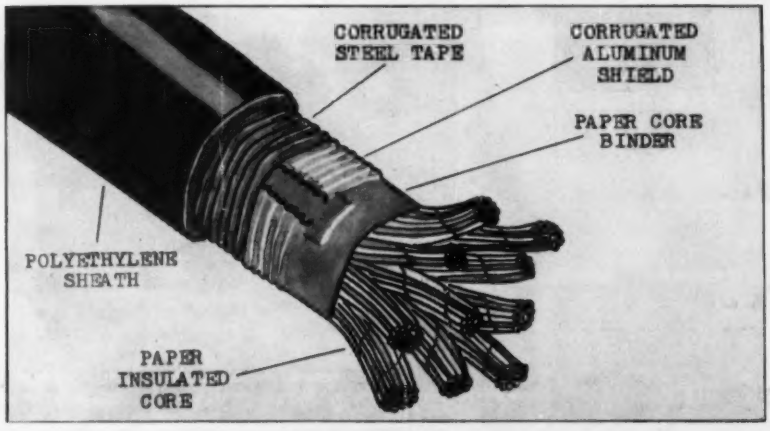


Fig. 3

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6. American Bank & Trust, Monroe, North Carolina
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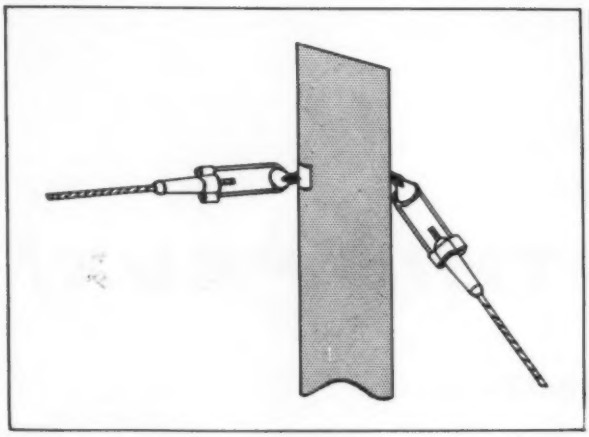


Fig. 5

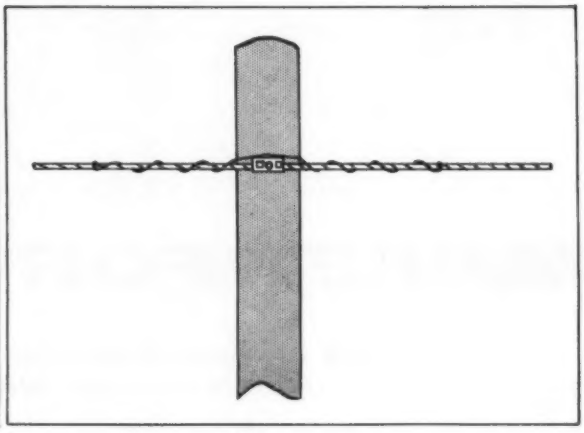


Fig. 7

Aerial Cable Installation

The installation of aerial cable can be divided roughly into four basic operations, as follows:

(1) Erection of poles and initial placement of guys and anchors.

(2) Stringing the suspension strand and taking up guy wires. Sometimes the suspension strand is called the messenger.

(3) Placing the cable.

(4) Cutting in (splicing) terminals.

The first operation, the erection of poles and the placing of guys and anchors, has been discussed in previous articles in this series.

The installation of the suspension strand involves three basic steps, namely, (1) paying out the strand along the pole line route, (2) raising the strand to the required height on the pole, and (3) drawing up the strand to the proper tension. Sometimes these operations can be handled one step at a time. At other times, the three basic steps are repeated several times as a long strand is placed or as various situations arise during the construction operation.

The strand must be placed high enough on the pole to provide at least the minimum clearance from the ground in the center of the span. The cable is suspended below the strand. Therefore, the strand must be at least the diameter of the cable higher than the clearance required for the lower edge of the cable. Clearance from the ground is an important consideration. However, in most cases, the aerial cable plant is placed to provide greater clearance than the absolute minimum permissible.

At the start of a cable run, the suspension strand is dead-ended, usually at an end guyed pole. A double eye-bolt is placed through the pole in line with the suspension strand. The suspension strand is attached to one eye of the bolt and the guy wire is attached to the other eye. This places a large share of the pull of the suspension strand on the guy wire.

The guy wire should be securely attached to the eye-bolt. Three typical methods of dead-ending the guy wire are as follows:

Three-bolt Clamp. The three-bolt clamp has two grooved metal plates that can be clamped together with three bolts. The suspension strand is threaded through the eye-bolt. Generally, a thimble, or a thimble eye-bolt, is used to protect the steel wire as the end is folded back against the strand. Next the three-bolt clamp is placed over the two sections of the strand about 6 inches from the eye-bolt. After the clamp is tightened, the free end of the strand, extending about 6 inches beyond the clamp, is lashed to the main strand. A completed three-bolt clamp dead-end is illustrated in *Fig. 4*.

Automatic Type Dead-end. The automatic type dead-end grips and holds a suspension strand slid into the unit. Once inserted the strand will not pull out. This device has the following two basic parts:

(1) A tube fitted with gripping chucks. The tube has a tapered body and a shoulder to fit into a yoke or collar.

(2) The yoke is fitted with a detachable bail.

The automatic dead-end is installed by detaching the bail from the yoke; inserting the bail through the eye-bolt and reassembling it to the yoke. Then the strand is inserted through the tube until about 2 inches of the end extends beyond the shoulder. The jaws of the chucks in the tube grip the strand and hold it in place. An automatic type dead-end installation is shown in *Fig. 5*.

Dead-ends of this type have been tested up to the breaking strength of the strand without damaging the strand

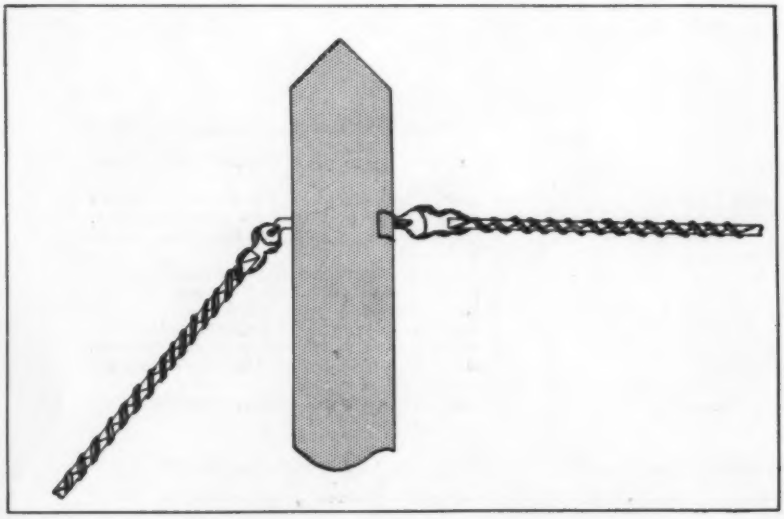


Fig. 6

(Please turn to page 52)

TELEPHONY'S Traffic Engineering Handbook

By Gilbert R. Brackett **March 8, 1958**

Section 11 (continued)
Miscellaneous Traffic Information

Dial Exchange Classification

An automatic exchange is usually classified according to the number of dial pulls necessary to complete a local connection.

100-line system, two dial pulls (Two figures).
1,000-line system, three dial pulls (Three figures).
10,000-line system, four dial pulls (Four figures).
100,000-line system, five dial pulls (Five figures).
1,000,000-line system, six dial pulls (Two letters—four figures).
10,000,000-line system, seven dial pulls (Three letters—four figures. (Two letters—five figures).

Traffic Information

In order to properly prepare an equipment schedule, the engineer should have at hand the following data:

(1) The exchange system desired.

(2) Type of line terminal equipment to be used.

(3) Classes of service involved.

(4) Number of working lines of each class for the initial period. (In general, the initial period provides for two years growth after the exchange is cut into service.)

(5) Number of spare line equipments to be installed. (The number of spare line equipments must be the same as the number of extra terminals provided for the connector when an LIDF is not furnished.)

(6) Number of spare connector terminals to be installed.

7) Average holding time per line during the busy hour (For each class of service).

(8) Average calling rate per line during the busy hour. (For each class of service.)

(9) Toll terminating traffic for each office.

(10) PBX terminating traffic for each office.

(11) Pay-station terminating traffic for each office.

(12) Ratio of busy hour traffic to total daily traffic (Used for estimating power equipment).

Inter-Departmental Cooperation

The traffic engineer should have a thorough knowledge of automatic central office engineering and a fairly good working knowledge of plant reactions in order to be able to translate equipment trouble into causes and the necessary corrective action to be taken.

He should be familiar with the many problems of service that take place in the central offices under his supervision, a few of which are:

(1) The general quality of service. Is it within the precepts of public acceptance? If not, are there plans "in the mill" to improve the conditions?

(2) The service given by special service—intercepting, repair, information, etc. Is it up to par with the general exchange service?

(3) The nature and amount of equipment trouble. Are the faults of such nature as to demand immediate improvement? Is the amount in excess of accepted standards? Are the troubles due to overloaded facilities? If so, what corrective steps are being taken?

(4) In general, is the plant department prompt in taking care of central office troubles when reported?

(5) Is the percentage of subscriber's faulty usage high? If so, what steps are being taken to reduce it?

(6) Are the number of verbal and written service criticisms high or normal? What is the nature of these criticisms?

(7) Is the assistance traffic above normal? What is the nature of this traffic? Is it caused by subscriber failures or are overloaded facilities responsible for the need for assistance?

(8) Per cent completed of total originating calls. Is it within the limits set for the office? Is it caused by inadequate customer facilities?

(9) Per cent equipment and operating irregularities, including per cent paths and trunks busy and overflow register readings.

The closest cooperation with your own organization as well as with the public is a must. Each department should make available to each other, information obtained from all available sources as to how the equipment is operating and being operated by the public.

The commercial people obtain such information from reports made by their sales and service representatives in routine contacts with the subscribers.

The plant department obtains this information from their routine tests and records kept at the repair clerk's positions, from assistance tickets prepared by assistance or toll operators, from various central office alarms, from routine contacts with the subscriber, etc.

The traffic department obtains this information from routine service observations, verbal and written criticisms, customer surveys, records kept by special service and intercepting operators, peg count, last trunk busy and overflow register readings, etc.

A traffic man in charge of an automatic office should be able to obtain so much more information on the quality of the service than are the representatives of other departments. Therefore, it may be necessary to bring to their attention unsatisfactory conditions beyond his control and to work with them in developing a plan of action to remedy the trouble.

(Section 11 will be continued next week)

AT&T Report Shows 2½ Billion Spent on Plant in 1957

BELL SYSTEM earnings were $13 a share of American Telephone & Telegraph Co. stock in 1957, President Frederick R. Kappel said on Feb. 18 in the company's annual report.

The earnings were based on the average of 63,811,000 shares outstanding—6,388,000 more than in 1956, when net income per average share equalled $13.16.

Bell System earnings on total capital were 6.7 per cent, compared with 6.8 per cent in 1956.

The Bell System spent more than 2.5 billion dollars in 1957 to enlarge and modernize telephone plant. Most of the new capital obtained last year was through the sale of bonds. These totaled just over a billion dollars. The average interest cost, Mr. Kappel pointed out, was nearly 4¾ per cent—the highest in many years.

Part of the money to expand and improve telephone service in 1958 will come from an issue of 718 million dollars of debentures convertible into stock. Share owners may buy one $100 debenture for each nine shares of stock held.

The AT&T report, mailed to more than 1,600,000 share owners, cited these gains in service:

In 1957 the Bell System added some 2,815,000 telephones, bringing the total operated by the system to 52,250,000.

Long distance conversations rose more than 7 per cent over 1956. Long distance service was the fastest ever. The average speed of connection was only 72 seconds.

The Bell System changed a million more telephones to dial service. Today 92 per cent of Bell telephones are dial-operated.

Some 5 million customers today can use DDD—Direct Distance Dialing—to as many as 30 million other telephones from coast to coast. Another 10 million customers can dial nearby cities and towns.

Since the opening of new telephone cable between the U. S. mainland and Hawaii last October, calls to and from the island territory have increased about 30 per cent.

The first telephone cable across the Atlantic, opened in 1956, is now so heavily used that work has already begun on a second cable which is expected to be ready in 1959.

Underlying all the progress, the AT&T report noted, are research at Bell Telephone Laboratories and manufacture of equipment by Western Electric. In addition, both organizations continue to work on guided missile systems and other vital defense projects.

At Bell Laboratories, Mr. Kappel said, for many years "the attack on communication problems has begun with basic research. This has made possible long distance service; the multiplication of talking paths over the same physical conductors; the development of radio relay systems; the creation of modern dial switching systems; and many other developments."

Among the new developments now under way at Bell Laboratories, Mr. Kappel said, is TASI—short for "Time Assignment Speech Interpolation." TASI is expected to increase greatly the capacity of telephone circuits such as those in the oceanic cables.

"Today twin ocean cables (one for each direction of talking) can carry 36 conversations at once," Mr. Kappel said. "What we look forward to is that TASI may as much as double this capacity. This it will do by taking advantage of the times when people are listening or pausing. The voice channels they leave temporarily unused will be automatically assigned to other talkers; and when a listener starts to talk, he will instantly have the use of a channel which another person has left idle."

The AT&T president also commented on the growing use of microwave radio: "In fact, use of radio is sure to be more and more important in enabling us to provide the best and most economical service in years to come. We have therefore asked the Federal Communications Commission to increase the number of microwave frequencies allocated to communication companies.

"The number of frequencies is limited, and a policy assuring their orderly assignment to companies serving the general public will allow far more efficient use of the radio spectrum than could result from indiscriminate licensing for private operation. Moreover, such a policy is essential to permit expansion of the communication network in ways that will best serve the nation's defense."

The annual report also stated that Western Electric sales in 1957 were $2,480,614,000 compared with $2,372,726,000 in 1956. Sales to the Bell companies were $1,821,198,000 compared with $1,648,875,000. Most of the balance was in sales to the government for national defense. Earnings in 1957 were $84,608,000, equal to 3.4 cents per dollar of sales.

In the spring of 1957 Western Electric sold 1,568,518 shares of stock. This provided $70,583,310 additional capital to the company and increased its outstanding shares to 15,685,184.

Bell System taxes were $1,784,000,000, or an average of $2.92 a month per telephone. Of the total, $1,269,000,000 (equalling $19.28 per share of AT&T stock) was in taxes on operations. The report added:

"The remaining 515 million dollars was in the federal excise tax paid directly by customers.

"This tax began as a war-emergency levy; it is discriminatory and should be ended as soon as possible.

"There is no excise tax on such other necessities as electricity, gas, water, or local transportation. Yet the telephone carries the same 10 per cent 'supercharge' as various luxury goods."

Expansion Program Planned For SW States Company

The Southwestern States Telephone Co. of Brownwood, Tex. for the second successive year has launched a construction program which totals more than 7 million dollars.

Construction during 1958 will almost equal the 1957 record construction program of more than seven and one-half million dollars. D. T. Strickland, vice president and general manager, said the huge construction programs are necessary to keep pace with the rapid growth of areas served in Arkansas, Louisiana, Oklahoma, and Texas and to keep abreast of developments in modern communications systems.

Eighty-one per cent of the company's 125,000 telephones now are automatically operated, as compared to 45 per cent five years ago and 22 per cent 10 years ago.

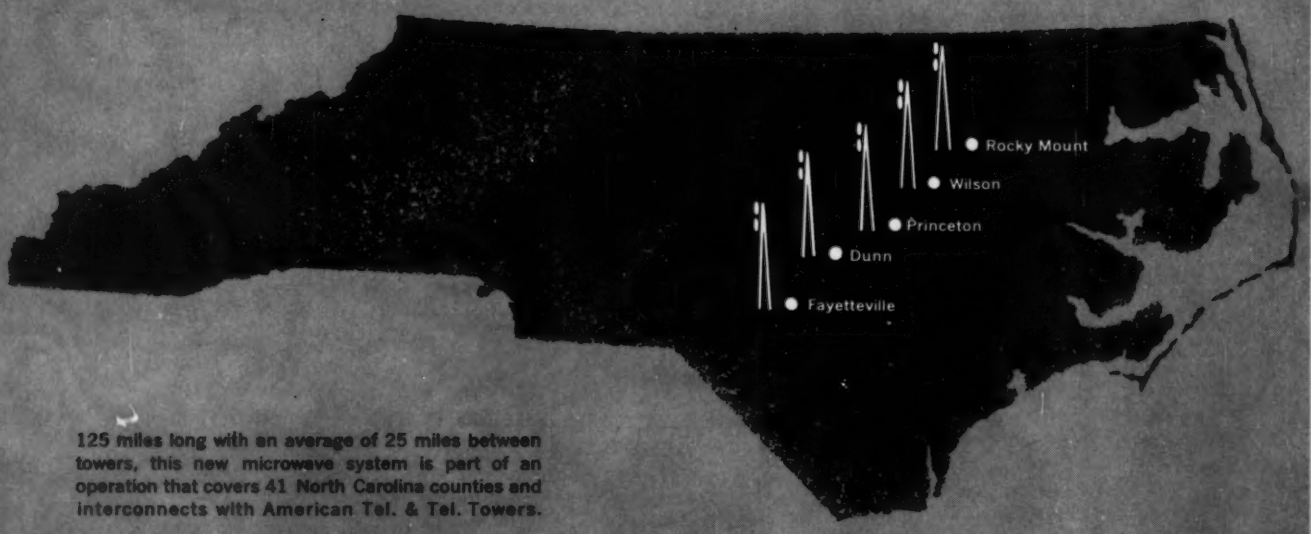
Southwestern States has spent some 30 million dollars in converting exchanges to automatic operation, installing additional central office equipment, constructing outside plant facilities and on other improvements in the past 10 years.

Another step in providing the most modern service available was the inauguration of the company's first system of microwave radio for handling long distance calls. This system was installed late in 1957 between Lindsay and Purcell, Okla., both of which have been recently converted to automatic operation. More microwave systems are to be installed in 1958.

Living Proof

"There is only one proof of ability—action."—MARIE EBNER-ESCHENBACH.

Progressive telephone company expands microwave service with five more Blaw-Knox towers



125 miles long with an average of 25 miles between towers, this new microwave system is part of an operation that covers 41 North Carolina counties and interconnects with American Tel. & Tel. Towers.

Erected by the Radio Construction Company of Pittsburgh, these Blaw-Knox Microwave Towers range from 150 to 250 feet high, and are built to handle additional antennas as service is extended.

Carolina Telephone and Telegraph Company have just installed their second microwave system since 1954. The new five tower section simplifies future expansion and permits the addition of hundreds of circuits at diminishing circuit cost.

Constantly extending and improving customer service, this company has nearly tripled its services in ten years to now serve nearly 150,000 telephones.

Today, as in 1954, Blaw-Knox Microwave Towers provide the dependable structures needed in an area where hurricanes have occurred in recent years. Located in a section where wind velocities have reached 100 miles per hour, Blaw-Knox Towers help maintain continuous service necessary for good customer relations.

A microwave system may be the cost cutting answer to your own expansion plans. For details on Blaw-Knox tower engineering, design, fabrication and erection services, write for Microwave Tower Booklet 2538.

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Courts and Commissions

N. Y. Commission Denies Business Rate Protest

The New York Public Service Commission on Feb. 21 denied a petition by nine New York City department stores for a rehearing on certain aspects of the rate increase granted New York Telephone Co. last year (TELEPHONY, Oct. 19, p. 38). The action was based on a decision that the petitioners "'do not allege any new facts or present any offer of proof other than matters which have had our full consideration."

The nine firms seeking a review of two phases of the ruling are Abraham & Straus, Bloomingdale Brothers, Gimbel Brothers, Inc., Lord & Taylor, R. H. Macy & Co., Inc., Martin's, Sak's 34th Street, and Stern Brothers.

In their petition for a reopening of the rate case the stores took the position that business and residence telephone rates should be the same. They also objected to the flat five-cent message rate the company now has in effect.

Discussing the contention that telephone rates should be identical for all customers, Commissioner Spencer B. Eddy, in an opinion adopted by the commission, stated that this is a problem of merchandising.

"We are quite sure," the opinion declared, "that the complainants themselves would be the last to urge that each item they offer to the public should be priced on the same margin of profit irrespective of other considerations."

The legislature itself recognized this problem, the opinion pointed out, when it provided that rates should be just and reasonable and should not be unduly discriminatory.

"This language clearly indicates that the legislature expected that there would be a broad field of tolerance and reasonable allowance for discretion in fixing rates—particularly as to form," the opinion stated.

Commissioner Eddy observed that the courts have sustained the validity of telephone rates which are based on service factors and that nationally, all major telephone companies charge higher rates for business service than are charged for service to individual residences.

The opinion notes that prior to the present telephone tariff, a subscriber served on a message-rate basis, was charged five cents each for the first 500 message units in excess of those allowed in his basic monthly charge; 4¾ cents each for the next 500, and 4½ cents each for the balance. Under the present tariff, the rate is five cents each.

In connection with the stores' objection to this aspect of the new rate schedule, Commissioner Eddy stated:

"Complainants urge that the increase to them has been proportionately greater than to other users of extra message units even though their cost per average call is still less. If the increase for all items of service of the complainants is considered, that increase is considerably less proportionately than for certain other groups, notably certain groups of residence customers."

The opinion concluded that, in view of the "over-all picture of the company's need for revenue and its equitable division over various classes of customers, we find nothing improper or inequitable in the rates complained of."

Ill. Bell Buys Two Independent Exchanges

The Farmers Mutual Telephone Co., Cartter, and the Farmers Mutual Telephone Co., Kell, have been sold to the Illinois Bell Telephone Co., it was reported on Feb. 20.

Illinois Commerce Commission approval was given to the sale previously (TELEPHONY, Feb. 23, 1957, p. 62) and the Federal Communications Commission recently ruled the sale to be in the public interest.

Hear 2 Neb. Rate Pleas

The Nebraska Railway Commission held hearings on Feb. 19 and 20 on applications of the Northern Telephone Co. and the Union Telephone Co., both of Blair, for authority to increase rates at Northern's Creighton and Niobrara exchanges and at Union's Bloomfield, Crofton, Verdigre, Winnetoon, Wausau, and Center exchanges.

OK Sale of Neb. Independent, and Rate Raise

The Nebraska Railway Commission on Jan. 28 granted authority to the American Communication Co., Belleville, Kan., to purchase the Riverton (Neb.) Telephone Co. American was also authorized to discontinue extended area service from Riverton to Franklin and Inavale, to establish rates at Riverton and to borrow $724,000 from REA.

The REA loan will be used to rehabilitate the Riverton exchange and other company properties located in Kansas.

The following rates were established at Riverton effective with the conversion to automatic operation:

One-party business	$7.25
One-party residence	4.75
Two-party business	6.50
Two-party residence	4.25
Four-party residence	3.75
Rural business	6.00
Rural residence	4.00

Local calls from paystations will be 10 cents. Rates were also established for electronic secretaries at $20.

General Telephone Corp. Buys Illinois Independent

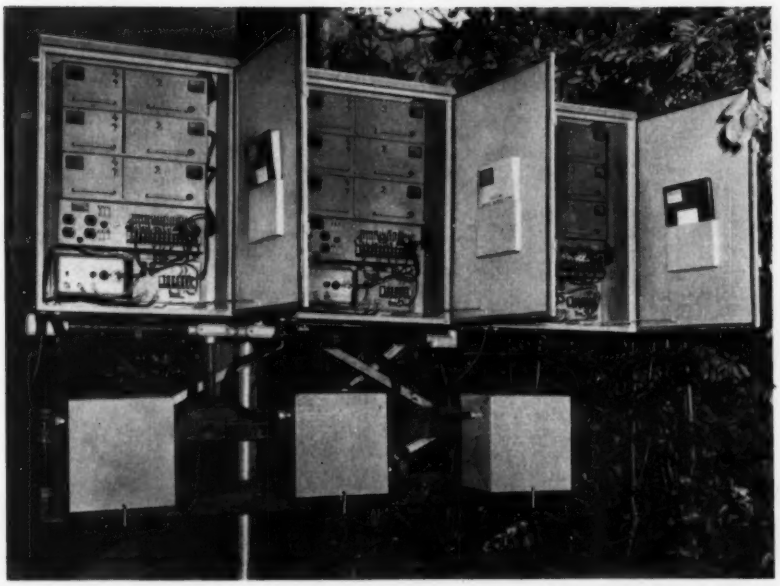
General Telephone Corp. announced on Feb. 8 that it has bought all the common stock of the Eureka (Ill.) Telephone Co.

The Eureka Telephone Co., owned by C. F. Melick, has about 1,500 telephones in service.

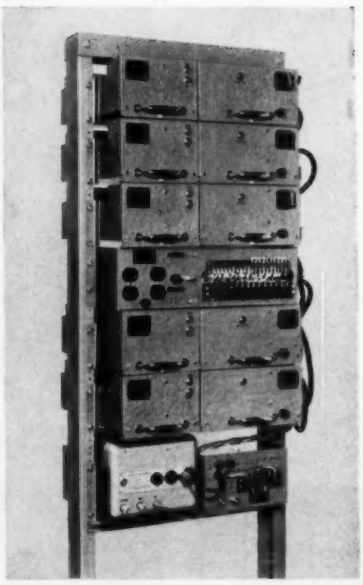
Mr. Melick has owned the company for 44 years.

OK Tenn. Independent Sale

The Tennessee Public Service Commission approved the application of the Southern Bell Telephone & Telegraph Co. to purchase the Readyville Telephone Co., it was reported on Feb. 9.



Lynch B-120 Subscriber Carrier equipment can be mounted in a Central Office 19-inch relay rack or in a Lynch A-48 weather-proof pole-mounted box.



The Lynch B-120 is a carrier system which provides an economical means for increasing the capacity of a party line.

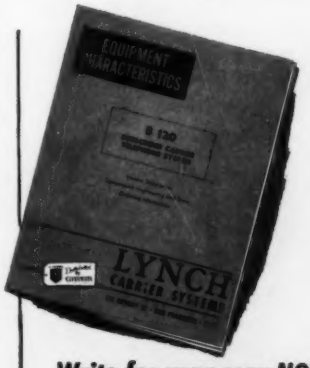
How to put more subscribers on existing lines . . . via Graybar

You can provide one to five individual carrier telephone channels with the new Lynch B-120 subscriber carrier telephone system—available from Graybar. You can superimpose all five channels on a telephone pair that may be carrying ten-party subscriber service. Each channel, working as a separate entity, complete with signalling, operates without interference with other channels or existing subscriber circuits.

You gain these 4 important advantages when you install the Lynch B-120:

1) Lower crosstalk levels; 2) lower operating frequencies; 3) more circuits on the same pole line or in the same entrance cable; 4) usable with any type of ringing system now in common use. For catalog and price information, plus seasoned help on any phase of carrier operation—call Graybar. Add our years of experience in telephony to yours and the toughest problems will get sound solutions—fast.

765



Write for your copy NOW!

"Equipment Characteristics" is a 74-page manual carrying a complete description of Lynch Carrier Systems, with a wealth of transmission engineering information and data. Write Graybar for a copy today. It will be mailed,—no charge or obligation.

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420 Lexington Avenue
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Graybar Quality Everything Electrical

IN OVER 130 PRINCIPAL CITIES

New Type 85

PROVIDE TWO-LINE PICKUP,

EXTENSION EXCLUSION
Pressing first button cuts off all extensions on Line 1. Pressing second button brings extensions back on the line (extensions are automatically restored when handset is replaced).
TYPE 85-C
TWO-LINE PICKUP
Turning this button connects telephone to a second line. By pressing this button, user can signal his secretary with a light or buzzer.
OPERATOR

Telephones

SIGNALING AND EXTENSION EXCLUSION

Here's a wonderful convenience for small commercial subscribers. We call it the Type 85-C Telephone (shown at left).

With this instrument, your subscriber has access to two outside lines. He can exclude all extensions. He can signal his secretary. He can do all these things with the versatile Type 85-C telephone—at the flick of a button.

The Type 85-C telephone fills a special need for many subscribers in your area. Doctors, attorneys, insurance offices, real estate agencies (and you'll think of many more) are all potential customers. They'll want the convenience, efficiency and privacy that the Type 85-C provides.

Subscribers will like the classic beauty of Type 85-C. It's identical with our famed Type 80. Has all the regular Type 80 features, too—including 10 attractive colors.

We'll be happy to tell you more about the versatile Type 85-C Telephone. Just write: *Automatic Electric Sales Corporation, Northlake, Ill. Or call Fillmore 5-7111.*

OTHER MODELS OF THE TYPE 85 TELEPHONE

TYPE 85-A. Has combined push-and-turn button only, for 2-line pickup and signaling. Can be wired, on the job, for these other arrangements: single-line ringer cut-off, single-line extension switching, single-line extension switching with ringer transfer, external ringer control, and extension exclusion with line shorting.

TYPE 85-B. Has pushbuttons only, for extension exclusion. Can be wired, on the job, for 2-line pickup.

AUTOMATIC AE CO ELECTRIC

A member of the General Telephone System—One of America's great communications systems

GENERAL SYSTEM

La. Bell Files New Suit Over Rate Consultant

Southern Bell Telephone & Telegraph Co. on Feb. 14 filed a new suit in Baton Rouge district court contending that a national rate expert's services are unnecessary to the Louisiana Public Service Commission and asking the court to force him to answer questioning by the company's attorneys (TELEPHONY, Feb. 22, p. 58).

Southern Bell maintained it would show through the testimony of rate consultant Arnold Hirsch, Washington, D. C., that Hirsch's continued employment by the commission is unnecessary. The suit also contended that a contract under which Hirsch was retained last year is invalid and that his fees are unreasonable.

Hirsch was employed by the commission last October in connection with an application by Southern Bell for an emergency intrastate rate increase. By law, the company is required to pay the consultant's expenses which in Hirsch's case amount to $100 a day whenever his services are required by the commission.

Earlier in another suit filed by Southern Bell over Hirsch's employment, District Judge Coleman Lindsey ruled the company had to pay Hirsch $1,800 for 18 days consultation. Lindsey's decision did not get into the company's allegation that Hirsch's services were unnecessary to the commission's investigation.

In the suit filed on Feb. 14, Southern Bell attorneys contended that unless Hirsch was forced to give them testimony when he was in Baton Rouge for a resumption of hearings on the requested rate increase, they would not have an opportunity to question him.

Southern Bell's petition says Hirsch would not otherwise be available for a deposition because of his residency out of the state and the fact that he travels throughout the nation on rate consultation cases.

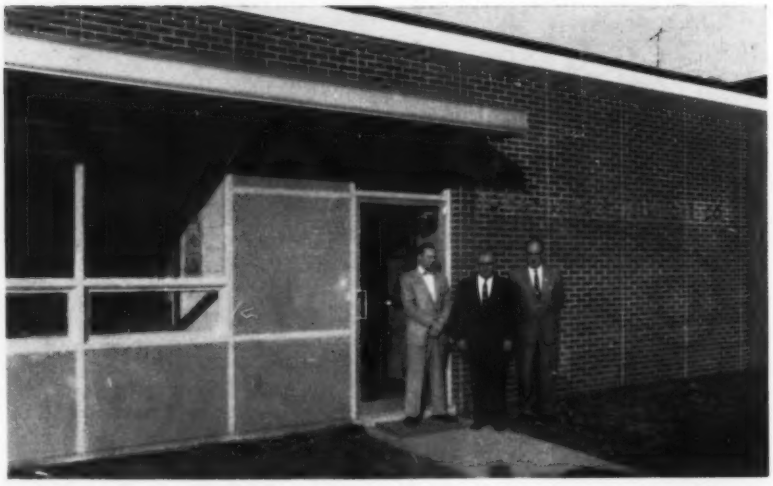
Dismiss Appeal of FCC OK Of Illinois Bell Purchase

The Seventh U. S. Circuit Court of Appeals recently dismissed a petition for review of a Federal Communications Commission decision approving the purchase of the Manhattan (Ill.) Telephone Co. by the Illinois Bell Telephone Co. (TELEPHONY, June 1, 1957, p. 36).

The appeal was filed by Harry Booth, Chicago attorney, for George J. Murphy, telephone subscriber and "The Business Men's League of the U. S."

The Federal Communications Act provides that the right of rehearing is dependent on a showing that the petitioner has been aggrieved or that his rights were adversely affected by an FCC action.

The commission took the position, in denying in April 1957, a request for rehearing filed by Mr. Booth on Jan. 30, 1957, that his petition did not give any basis for a rehearing.



More than 150 people were on hand recently for the cut-over celebration which brought XY-dial operation to New London, Ia., headquarters for the Iowa-Illinois Telephone Co. Guests of Arthur W. Sanders, vice president and general manager of the company, viewed the 500-line, 1000-terminal equipment, the latest of their many exchanges to be converted to automatic. About 70 per cent of the Iowa-Illinois company exchanges are automatic at present, with more slated for conversion as a part of the over-all program being carried on by the company and its affiliate, the Western Illinois Telephone Co., both owned by the General Waterworks Corp. of Philadelphia. Away from the crowd for a moment are, from the left, F. C. Anderson, chief engineer; C. K. Byers, plant superintendent; and A. W. Sanders, vice president and general manager, just outside the new headquarters building of the Iowa-Illinois Telephone Co.

United Of Carolinas Asks Rate Increase In N. C.

The United Telephone Co. of the Carolinas, Southern Pines, recently petitioned the North Carolina Utilities Commission for permission to increase its rates by $227,000 a year. The company estimates that this increase would net them an additional $125,000 yearly.

The company said that during the period from 1951 through 1957 it spent $2,980,000 on plant construction in North Carolina.

Southern New England Company Markets Bonds

Southern New England Telephone Co., New Haven, Conn., has raised 30 million dollars by selling a block of 33-year debentures, it was reported on Feb. 27 (TELEPHONY, Feb. 15, p. 35).

Underwriters led by White, Weld & Co. and Kidder, Peabody & Co. took the issue with a bid of 101.5999 on a 4⅛ per cent coupon. That made Southern New England's borrowing cost 4.04 per cent.

Book Review

"INTRODUCTION TO PRINTED CIRCUITS," by Robert L. Swiggett; 101 pages; $2.70.

This book by the vice president of Photocircuits Corp. covers the entire field of printed wiring from the design, manufacturing and servicing points of view. It is fully illustrated and gives basic information about processes and equipment used in making phenolic- and ceramic-based circuits; components for printed circuits; assembly systems; and servicing considerations for each type of circuit.

Numerous practical applications are discussed and the maintenance techniques peculiar to printed circuits are explained.

You can buy this book from TELEPHONY.

Request EAS OK in Illinois

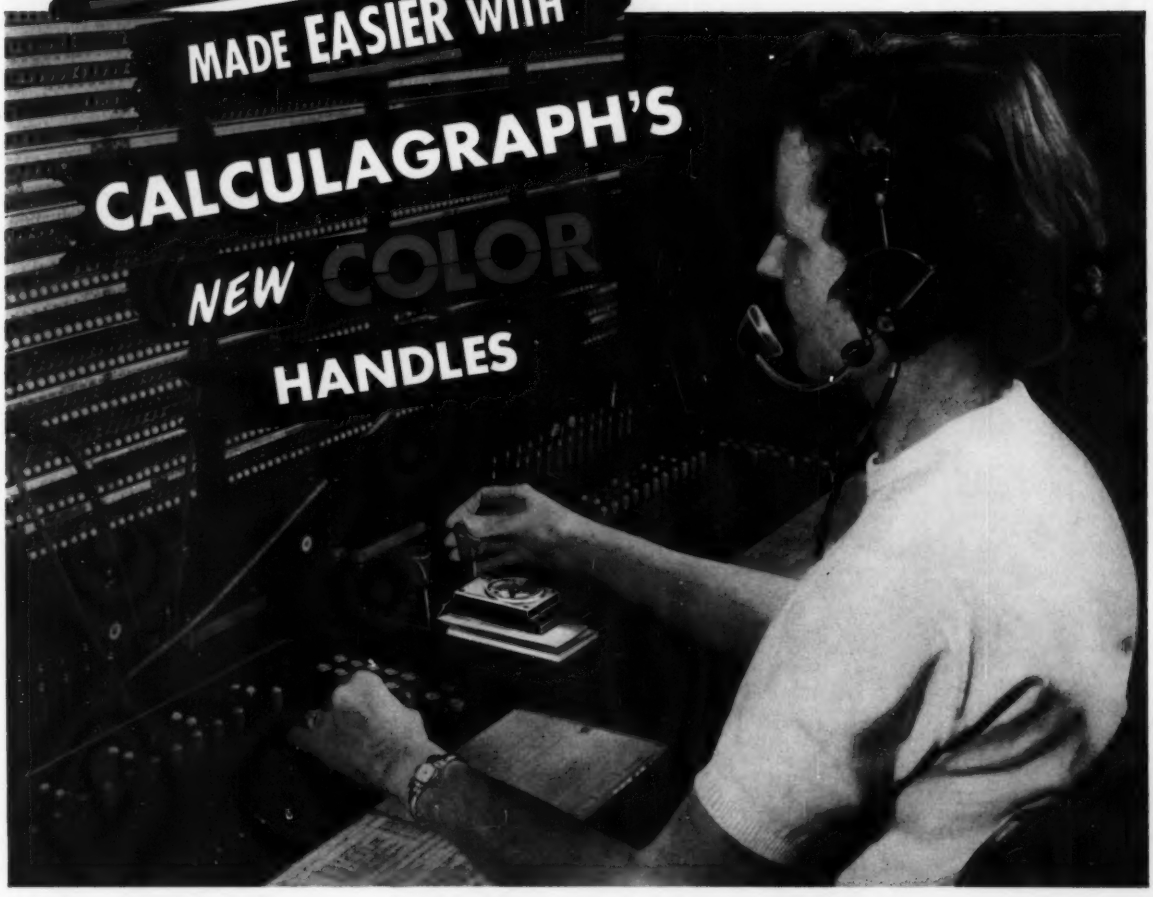
The Illinois Commerce Commission on Mar. 5 was scheduled to hear the petition of Bondville subscribers for extended area service between the Bondville exchange of the Champaign County Telephone Co. and the Champaign-Urbana exchange of the Illinois Bell Telephone Co.

OK Sale of Tenn. Company

The Tennessee Railroad & Public Utilities Commission recently approved

(Please turn to page 41)

NOW—TIMING TOLL CALLS MADE EASIER WITH CALCULAGRAPH'S NEW COLOR HANDLES



Now, Calculagraph takes another BIG step to make toll timing easier for busy operators—it's the new color handles—green for start, red for finish.

This new Calculagraph "visual aid" to better accuracy can be a big help to your busy operators, too. Why not ask about these new color handles today. It takes but a few minutes to change your present handles to easier-to-use Calculagraph color handles.

Write today for information on the new color handles and other exclusive Calculagraph features for timing toll calls.

CALCULAGRAPH Company

308A Sussex Street • Harrison, New Jersey

MANUFACTURERS OF ELAPSED TIME RECORDERS FOR OVER 65 YEARS

Where does progress begin?

Kendall Preston Jr., S.M. in engineering from Harvard University . . .
graduate of the Laboratories' Communications Development Training Program.

Progress begins in the mind—in the perception and appreciation of new ideas. In the past the ideas that sparked progress too often had to wait on the random interest of genius. Today more and more new ideas come from men trained to an awareness of that which is yet to be accomplished.

At Bell Laboratories, communications science is entering upon its most challenging era in history. As never before, progress will depend upon men who have acquired the special training needed to think creatively in this exciting field.

Bell Laboratories provides the young college graduate with unique opportunities to develop his creative abilities. During his first two years, he spends two or three days a week as part of his job, taking postgraduate courses in basic mathematics, physics and electronics. This he does at a graduate study center which has been established at the Laboratories by New York University. As he gathers a broad fundamental knowledge which will enable him to tackle every type of communications problem, he also gathers credits toward advanced degrees. To round out his education, he spends a third year on special phases of communications technology.

By helping scientists and engineers to reach their top development, Bell Laboratories has helped to make your telephone system the world's best—and will keep it so.

BELL TELEPHONE LABORATORIES

WORLD CENTER OF COMMUNICATIONS RESEARCH AND DEVELOPMENT

the sale of the Lascassas Mutual Home Telephone Co. to the Southern Bell Telephone & Telegraph Co. The sale was announced by W. D. Hall, president of the Lascassas company.

Requests OK in Oregon to Pass on Municipal Taxes

The Oregon Public Utilities Commissioner on Feb. 21 ordered an investigation made of the Northwest Telephone Co.'s petition for approval of a revised tariff covering the billing of subscribers within the boundaries of cities which impose taxes on the company.

These muncipal taxes include franchise, business, occupation, excise or use-of-street taxes. The company seeks to add the following revised section to its tariff:

"When any municipal corporation or other local taxing agency imposes on the company any franchise, occupation, business, sales, license, excise or privilege tax or exaction, the amount thereof will be billed pro rata to customers receiving service within the boundaries of such municipal corporation or taxing agency by separately stating and adding to the regular billing to the customer."

Having found that sufficient cause existed to investigate the propriety and reasonableness of the above provision's adoption, the commissioner on Feb. 21 suspended it for a period not to exceed six months from Feb. 24.

The commissioner on Jan. 30 ordered an investigation of a similar petition from the West Coast Telephone Co., Everett, Wash. (TELEPHONY, Feb. 15, p. 33).

Illinois Company Asks Rate Increase

The Intra-State Telephone Co., Galesburg, at a hearing before the Illinois Commerce Commission on Feb. 27 presented evidence supporting its request for a rate increase.

Ray J. Alter, company manager, told the commission the company seeks the increase to help pay for a 1½-million-dollar expansion and modernization program in which the company is presently engaged.

OK Sale of 7 Exchanges To Two Minn. Companies

On Feb. 24 the Minnesota Railroad & Warehouse Commission authorized the following purchases:

The Mille Lacs Telephone Co., Osakis, was authorized to purchase the Haybrook Telephone Co., Isle, which now serves 19 stations adjacent to the Mille Lacs operating area.

The East Otter Tail Telephone Co., Perham, was authorized to purchase the Nevis Telephone Co., the Deer Creek Telephone Co., the Walker Telephone Co., the Bertha Telephone Co., which operates exchanges at Bertha and Hewitt, and the Akeley Telephone Co. which on Feb. 10 was granted a rate increase by the commission.

Ill. Commission OK's Rate Raise for Independent

The Illinois Commerce Commission on Feb. 19 authorized the Northwestern Telephone Co., Freeport, to increase its rates by $236,177 annually, effective Apr. 1 (TELEPHONY, July 20, p. 41).

It is estimated that this increase will raise the company's annual net revenue by $178,429. The commission said this would amount to a 5.35 per cent return on property valued at $4,575,000.

In granting the increase, the commission ordered the company to reduce the load on rural lines to 10 or less subscribers, to rehabilitate switchboards and to add toll circuits between the Freeport exchange and tributary exchanges on the basis of a proposed traffic survey, and to add necessary cable facilities in those exchanges now showing evidence of congestion.

Authorize Rate Raises for Two Minnesota Companies

The Minnesota Railroad & Warehouse Commission on Feb. 24 approved rate increases for the East Otter Tail Telephone Co., Perham, and on Feb. 10 rate raises for the Johnson Telephone Co., Remer.

Rate increases authorized for the East Otter Tail company will raise operating revenues from $130,178 to $143,460 and net income from $25,822 to $35,067. This income figure represents a 3.42 per cent return on the $1,024,960 rate base. The commission computed the rate base as follows:

Gross book cost at 10/1/57	$1,018,999
Add for Current Value*	101,900
Sub total	$1,120,899
Less depreciation reserve	112,841
Sub total rate base	$1,008,058
Material and supplies	9,890
Cash working capital	7,012
Total rate base	$1,024,960

*The amount of $101,900 in the opinion of the commission represents a fair adjustment to recognize Current Value.

The East Otter Tail company serves approximately 890 local and 1088 rural stations, with extended area service (EAS) between New York Mills and Perham; Otter Tail has EAS between

SAFE with PLASTIMAYD

DAY OR NIGHT

NEW Safety Yellow Jacket . . .

combines High Visibility with High Dielectric Resistance — excellent protection for every utility, construction, maintenance and road crewman. Made of the same top visibility yellow color approved best for hunters. Fabricated from tough Bakelite "Krene" with 9,600 volt dielectric resistance. Super-Weld* seams, waterproof, cold weather flexible, won't mildew or rot, easily laundered. Has attached parka for complete foul weather protection.

16,000-volt dielectric resistant jackets & pants also available.
Write for Bulletin T-Y

PLASTIMAYD PRODUCTS CORPORATION ®
*TM Portland 14, Oregon

MFRS. AERIAL TENTS • MANHOLE GUARD COVERS • SAFETY TARPS

Perham and New York Mills; and EAS between Dent and Perham. Approved net rates are:

	Perham	New York Mills	Dent and Otter Tail
Business:			
One-party	$9.00	$8.50	$8.25
Two-party	8.00	7.50	7.25
Rural multi-party	7.25	7.00	6.75
Residence:			
One-party	5.75	5.50	5.50
Four-party	4.75	4.50	4.50
Rural multi-party	4.75	4.75	4.75

The Johnson Telephone Co., under existing manual rates, is realizing operating revenues of $13,146. With dial service rates, this figure is expected to reach $31,528. Net income, now $785, will rise to $6,729, it is estimated. This will represent a 2.7 per cent return on the rate base after conversion to automatic operation. The company's exchange at Remer serves approximately 330 stations. Present plans call for increasing the number of owned stations to 427 during the next five-year period.

Gross manual rates and approved net dial service rates are:

Business:	*Manual*	*Dial*
One-party	$5.75	$9.25
Two-party	5.00*	8.25
Rural multi-party	4.25(a)*	6.75
Residence:		
One-party	3.50	5.25
Two-party	3.00*	5.00
Four-party	2.50*	4.75
Rural multi-party	3.25(a)*	4.75
Service switching station	1.00 Net	—
Excess mileage charge for service beyond the local base rate area, each one-eighth mile or fraction thereof:		
One-party	.30 Net	.40
Two-party, each subscriber	.20 Net	.25
Four party, each subscriber	.15 Net	.15

*An additional charge of 25 cents per month for a handset instrument.

(a) Rural common battery service will be extended only upon demand of at least six subscribers within 5 miles of the central office and said six subscribers are located along the same existing pole line following the same general direction.

Colored handset:

	Installation Charge
Standard full color (other than black)	$7.50
Two-tone	5.00

General Asks Purchase OK On Indiana Company

The Indiana Public Service Commission on Feb. 25 took under advisement a petition by General Telephone Co. of Indiana to purchase the properties of the Arlington Telephone Co.

Testimony was presented that the Arlington company's incorporation has expired and that storm damage has left residents of the area virtually without telephone service.

Dr. L. H. Denman (above) of Lufkin, Tex., president of the Lufkin (Tex.) Telephone Exchange, holds his own at an American Medical Association meeting—if he can spare the time from his busy practice. He's one of the best-known physicians in this part of Texas. The telephone in his office rings constantly. If the telephone *didn't* ring, Dr. Denman would be concerned, for he and his family brought the first telephone system to Lufkin back in 1900. Responsible for bringing the Lufkin Telephone Exchange to its present standard of excellence are Marion Clay, general manager since 1952; John Harris, plant superintendent-engineer; Jack Mott, equipment supervisor; and Morris Bateman, district manager at the Conroe office.

Authorize Rate Raises for Three Wisconsin Companies

The Wisconsin Public Service Commission on Feb. 17 authorized rate increases for three Independent companies.

The Washington Island Telephone Co. was authorized to raise its rates by $720 per year (TELEPHONY, Jan. 11, p. 54).

The Eastern Alto Telephone Co., Alto, was given a raise of $1,366 annually (TELEPHONY, Jan. 18, p. 30), and the Ogdensburg Telephone Co., Waupaca, was authorized to raise its rates $1,024 yearly.

General of Ohio Names Operating Vice President

The appointment of F. W. Hamper as operating vice president of the General Telephone Co. of Ohio, Marion, was announced in New York on Feb. 24 by Donald C. Power, president of the General Telephone System. He replaces Richard H. Rawlings, who resigned.

Mr. Hamper has been personnel director of the General Telephone Co. of the Southwest, in San Angelo, Tex. He began his career with the General System in 1941 as frame man in Ashland, Ky., and has worked in both plant and personnel departments since.

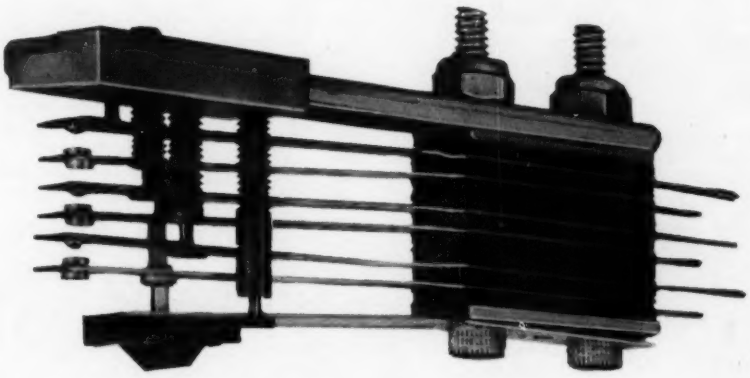
F. W. HAMPER

Mr. Hamper's post in General Telephone Co. of the Southwest will be filled by Frank Lennberg, director of personnel of the Ohio company, who has been with General since 1952.

To Do A Good Job

"The first essential to success in the art you practice is respect for the art itself."—BULWER-LYTTON.

ESCO RINGING EQUIPMENT



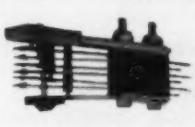
MEMBER

. . . a new twist in interrupter design assures simple, permanent pile-up adjustment

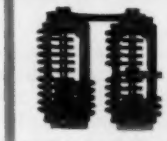
Just a simple twist of the set screws in ESCO Interrupter Pile-Ups, and you get accurate spring adjustments that stay put. You never need to use old-fashioned spring bending methods. Springs and contacts last longer because springs retain their original shape and tension, and contacts stay in alignment. This new design, too, allows up to six adjustable springs on the same pile up and that means better timing with fewer cams.

But this exclusive adjustment feature is just one of many reasons why operators and engineers who design and install equipment insist on ESCO. Compact vertical-mounting, factory pre-wiring, and permanently aligned drives on Esco Ringing Assemblies are other clinching reasons.

Why not find out for yourself why only ESCO Ringing Equipment can give the kind of service that satisfies operators and their subscribers alike. ***Write today for full information.***



Screw adjusted pile-ups



Compact, accessible interrupters

Combination alternators

Lifetime drive motors

"Ready-to-go" pre-wiring

Permanently aligned drives

ADDITIONAL ESCO FEATURES (details in future ads in this series) explain why ESCO components are included in the installations of prominent suppliers like Automatic Electric Co., Federal Telephone and Radio Corp., Kellogg Switchboard Supply Co., Leich Sales Corp., Stromberg-Carlson Co.

ESCO ELECTRIC SPECIALTY CO.
176 South Street, Stamford, Connecticut

Snow Can't Keep New York Operator Home From Work

UPSTATE New York, in fact all the northeastern section of the the country, learned what winter really can be like on Sunday, Feb. 16. Newspapers throughout the nation carried numerous pictures of mountainous drifts, marooned herds of livestock, and valiant state-troopers, civilian defense workers, and Army personnel, who manned the helicopter air-lift to bring hay to the animals and food and medicines to the snow-bound families. Reams of copy were written describing the conditions. Schools were closed; business and industry came to a standstill as customers and employes stayed home to dig their way out. On Monday, Feb. 17, it was estimated that 40,000 people in Albany, N. Y., alone, did not report for work that day.

Feb. 17 was a day off the beaten track for Sally Joy, an attractive 18-year old miss who lives way up in the Adirondacks, three miles up a mountain outside Au Sable Forks, and who is employed as a switchboard operator by the AuSable Valley Telephone Co. of Keeseville.

When Sally Joy's alarm clock jingled in the pre-dawn chill that Monday, she responded automatically, as always. Looking out her window, she saw the smooth, white drifts which were beautifully fashioned by the howling wind. They were already deep enough for a man or woman to become buried in them—and they were getting deeper. The house atop "Ragged Mountain" was surrounded by drifts which would even make opening the door difficult. The mercury in the thermometer stood at a bone-chilling 10 degrees below zero.

Sally looked out to where the road to AuSable Forks, her duty station, ought to be. It, too, lay beneath the trackless snow. To get a car through, was utterly unthinkable and impossible. One couldn't contemplate walking the three miles without risking frostbite, exhaustion—even death. No one would have blamed Sally if she had hopped back into her warm bed and forgotten about work. She didn't, however.

Instead, she got out some especially warm clothes and put them on. Then, bucking the arctic blizzard wind, which had forced anything that could move to find a place to hide and stay there, Sally made her way through the drifts to the barn and saddled her Tennessee walking horse.

Together, Sally and her mare set out over the road where no one else had yet ventured on this bitter day. The horse floundered, its belly dragging in the cold white snow. But, Sally Joy, expert horsewoman and an outdoor girl, used to the cold of the ski slope and ice skating rinks, kept her horse moving down the road to her job, to her duty, to serve the telephone needs of the community. She knew the traffic load would be heavy because of the storm and that, undoubtedly, there would be emergency situations to be met—perhaps even lives to be saved—if the switchboard was fully staffed.

Down the three-mile stretch of mountain road, through woods, through territory without houses for miles, Sally rode her mare, reaching her destination an hour and 15 minutes after leaving home. She put her horse to rest in a nearby barn, did her tour of duty, and in the evening, rode the mare home again. She admitted later, that she "got a little cold—you just can't get used to that biting wind."

There are those who will insist that Sally Joy needlessly and uselessly exposed herself to great hazard.

"After all," they will say, "how important can one telephone operator be?"

There are others, more numerous, who will agree with Sally's boss, George S. Beckwith, president and general manager of the AuSable Valley Telephone Co., Inc., that hers is a laudable accomplishment and that Sally deserves a bouquet of orchids for her loyalty and devotion to duty.

Plan U. S.-to-Puerto Rico Submarine Telephone Cable

Plans for construction of a direct submarine telephone cable system between continental United States and Puerto Rico were announced on Feb. 19 in a joint release by the Long Lines Department of American Telephone & Telegraph Co. and International Telephone & Telegraph Corp.

The announcement coincided with the filing of construction applications with the Federal Communications Commission seeking authority to build and operate the cable system.

The plans provide for work to start on the cable system in 1958, with service scheduled for early in 1960. The cost, according to present estimates, will be about 17 million dollars and will be shared equally by Radio Corp. of Puerto Rico, a subsidiary of IT&T, and by Long Lines.

The two companies noted that telephone traffic between the mainland and Puerto Rico had more than doubled during the past five years. At the present time, telephone service is handled by radio.

To meet the current normal demand for service between the continental United States and Puerto Rico, the existing radio circuits are operating at full capacity, the announcement pointed out. The public demand for such service has been increasing rapidly and is expected to continue. The existing radio systems will remain in use and with the cable system will provide diversity and protection. Also, the combined radio and cable circuits will more than triple present capacity.

The deep-sea system will consist of twin cables that can carry at least 36 simultaneous conversations. A similar cable system between Key West and Cuba is being operated by a company jointly owned by AT&T and IT&T.

The new cables will contain built-in voice amplifiers, which were developed by the Bell Telephone Laboratories. The over-all length of the cable route —to extend between Florida and Puerto Rico—is about 1,100 miles. At some points, the cables will be in water 3½ miles deep.

General Of Pa. Makes Three Plant Promotions

General Telephone Co. of Pennsylvania has announced three plant promotions.

Donald S. Parsons has been appointed general plant supervisor. Mr. Parsons was formerly Erie division plant superintendent. He has held positions as lineman, line foreman, construction supervisor and group plant supervisor.

Succeeding him as plant superintendent is William J. Hooker, formerly general plant construction supervisor. Mr. Hooker has served as a cable splicer, lineman, line foreman, station repairman, plant engineer, general construction foreman, and material and supplies supervisor.

The new general plant construction supervisor, succeeding Mr. Hooker is William H. Miller, who has been a groundman, lineman, installer-repairman, fieldman, outside plant engineer and division plant engineer.

S. D. Company Incorporates

The Western Telephone Co., Plankinton, recently filed articles of incorporation in South Dakota. Directors are: William Mitchell, Ephriam Mairose, Herbert Miller, Joe Bosworth and Sylvester Weniger, all of Plankinton.

A communications utility used its 702 to dig 18,000' a month. One job—opening 2500'—cost one-third of the estimate . . . establishing a new low for underground cable installation.

Now you can place your cable underground at low cost

The many advantages of having electric and telephone cables underground have long been recognized. The chief obstacle has been the cost of digging and backfilling the required trench.

The new Barber-Greene 702 Ditcher has solved this problem. Despite its small size, the 702 is the newest machine in the most rugged line of ditchers made.

Prior to this new development, available machines either dug too wide for practical and economical operation, or did not have the stamina and digability required for coping with unfavorable conditions.

Utilities, contractors and railroads are now gaining the advantages of underground lines and services in virtually every area of the country.

Applications, to date, include electric power and telephone lines and house services, railroad signal systems, traffic control systems, outdoor theater wiring, installations of small gas and water lines and services, lawn sprinkling systems, and others.

Digs to 40" deep, 5" wide. The 702 can be towed or carried on a light truck. Simple dual controls permit operation from seat or from side of machine for full view of trench.

56-10-D

Write for literature on this important, new, low-cost ditcher

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CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

ECONOMIC SELECTION STUDIES

Continued from page 22

affected by outside plant, they are not included in studies of different outside plant plans. These costs are, however, included in studies involving different types of central office switchboards or different numbers or arrangements of central offices.

2.314. *Commercial expense* involves the cost of handling business contacts with the general public. It includes the cost of writing or terminating contracts with customers, sales work, advertising, directories, and collecting the revenues of the company. As these are items not affected by outside plant, they are not included in plant economic selection studies.

2.315. *Administration* and *general expenses* cover the salaries of the officials of the company and their staffs, together with their traveling expenses. They also include company legal expenses, and injury and property damages not in connection with construction work in progress. These expenses are also omitted from studies comparing different plant plans.

2.320. *Fixed charges* are those annual charges which are more or less constant in relation to the investment and which may be expressed as a percentage of the investment or first cost of the plant. These charges continue whether the business is operated or not, and do not fluctuate much with economic conditions.

2.321. Fixed charges:

(a) Cost of money.
(b) Depreciation.
(c) Taxes.
(d) Insurance.

2.322. *Cost of Money (C/M). Interest* may be defined as the sum paid for the use of borrowed money. If somebody borrows money for a term of years, he pays interest at the end of each year for the use of this money. The "owner" of the money then has an additional sum of money (the interest) available for use. This he can loan and, thus, he would receive interest on the interest of the original sum loaned.

If the borrower failed to pay the interest at the end of the first year, he would owe the sum borrowed (the "principal") plus interest, and must pay interest during the next year upon this new amount—principal plus the preceding year's interest. This would be fair inasmuch as the person loaning the money would be deprived of the use or opportunity to loan the unpaid interest and to receive an income from it as if it were "new" money. This system of interest on interest is a general business practice and is called "compound interest."

Suppose that $100 was put out at 6 per cent interest for five years. An example using these figures to show the difference between simple interest and compound interest follows:

End of Year	0	1	2	3	4	5
		Simple Interest				
Principal	$100	$100	$100	$100	$100	$100
Interest	—	6	6	6	6	6
Total Interest	—	6	12	18	24	30
		Compound Interest				
Principal and Accumulated Interest	$100	$106	$112.36	$119.10	$126.35	$133.83
Interest	—	6	6.36	6.74	7.15	7.58
Total Interest	—	6	12.36	19.10	26.25	33.83

From the above, it will be noted that by simple interest, $30 was earned, whereas, by compound interest the same $100 at the same interest rate of 6 per cent, earned $33.83, considerably more than by simple interest in the same time.

In economic selection study work, factor tables, based upon compound interest, are used in many of the calculations.

At this time, the amounts of money required by large industries are of such size that it becomes necessary to acquire the funds from the sale of securities to the general public. Such securities may take the form of bonds or of stock.

Bonds are certificates stating that the company has borrowed a definite amount of money from the bondholder, that a fixed rate of interest will be paid, and that the amount borrowed will be returned by a definite date. Therefore, a bond is a statement of indebtedness to the bondholder on the part of the company issuing the bond. In the event of the company incurring financial difficulties, bondholders have first claim upon the assets of the company. Since the bondholders' money enjoys a rather protected status, the rate of interest upon the borrowed funds as represented by the bonds is generally low.

Stock is a kind of deed to ownership in the business. When a person buys stock in a company, he becomes one of the owners of the concern, and periodically receives a proportion of the profits of the company. If the owner of the stock wishes to obtain the purchase price back by relinquishing his ownership represented by the stock certificate, it becomes necessary for him to sell his stock, just as he would sell his house or any other possession he owned. Stock is evidence of ownership on the part of the stockholder.

The money paid a bondholder for the use of his funds is *interest*, in the strict interpretation of the word as defined previously. The money received by a stockholder is not for the use of borrowed money, but represents the stockholder's share of company profits, and is called *dividends*. Dividends being a part of the profits are distributed after expenses of the company are paid. One of these expenses is the interest on bonds.

A large concern, then, can be expected to pay either or both interest and dividends on the funds it requires. In addition, a clerical force becomes necessary to maintain a record of bondholders and stockholders and the amount of their holdings, and to distribute the interest or dividend payments. Also, to acquire this capital, the services of a brokerage firm may be required, and some amount of special advertising and printing will usually be necessary. All of these items: Interest on bonds, dividends on stock, clerical help, brokerage fees, and miscellaneous associated expenses, added together, represent on an annual basis the price paid to acquire the capital necessary to carry on the business of the company. This total is termed *cost of money* (C/M), and is taken as one of the fixed charges as a percentage of the first cost of an item included in the study. The cost of money is treated exactly as it would be if it consisted of interest only, i.e., it is compounded annually, and is applicable to other treatments of interest. Upon it are based the tables described in paragraph 3.000, which is to follow.

(To Be Continued)

Wash. Independent Names New Controller

Ross Anderson, has been named controller of the West Coast Telephone Co., Everett, Wash., succeeding John H. Warren who has resigned.

Mr. Anderson was born in Everett and joined West Coast in 1948. For the past five years he has been general accountant and assistant secretary of the company. During World War II he served with the Eighth Air Force in England. He flew in 27 combat missions and received the Air Medal with clusters.

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With the development of this smaller, lighter loading coil, Automatic Electric brings you two important benefits:
(1) You'll save valuable space in vault installations, and
(2) You can use lighter poles for aerial mountings.

The Type 58 loading coil is about the diameter of a half dollar. What's the secret? Molybdenum-permalloy—a core material with high permeability that permits a much smaller core. Result: a lighter, smaller coil. In addition, Type 58 loading coils are moisture-proofed in a new way. Instead of using impregnating materials, they're pressure-sealed in gas-tight steel cases.

If you're looking for an economical way to meet top transmission standards on inter-office trunks, long subscriber loops, or for Direct Distance Dialing, consider Automatic's Type 58 loading coils. Incidentally, they're fully compatible with Western Electric models.

To find out all about this new loading coil, write for Circular 1886. It contains complete information. Address: *Automatic Electric Sales Corporation, Northlake, Illinois. Or call Fillmore 5-7111.*

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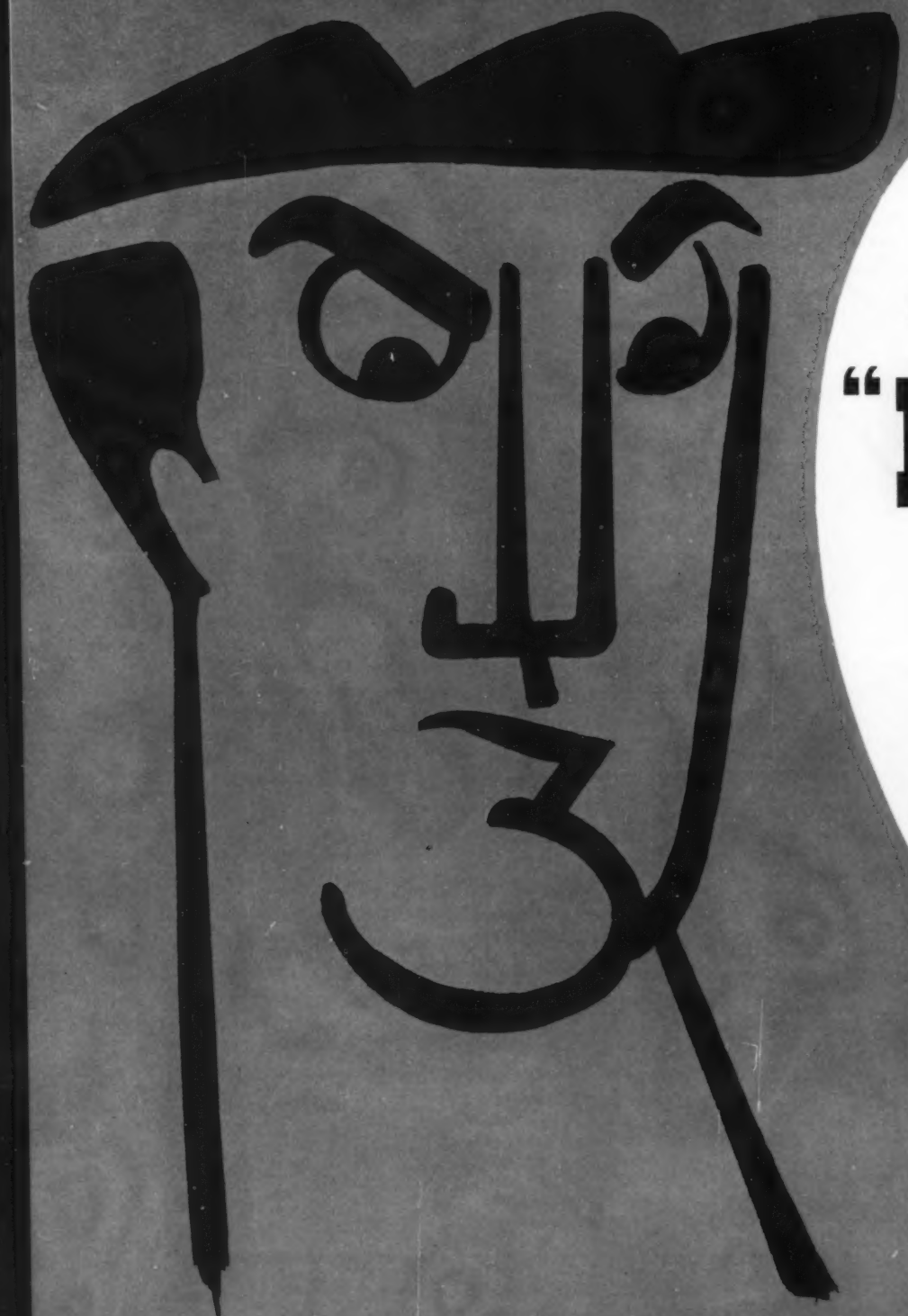

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—that in 10 hours it could fill a tank truck?

—that the liquid most like blood is sea water?

These are just a few of the astounding facts about your heart that you'll learn when "Hemo the Magnificent" returns to your television screen. Never before have scientific subjects been presented so clearly, colorfully and interestingly as in the Bell System Science Series, which has also brought you "Our Mr. Sun," "The Strange Case of the Cosmic Rays" and "The Unchained Goddess."

The finest talent in Hollywood has teamed up with many of the nation's outstanding scientists to make the Series a "must" for every television viewer.

Frank Capra, three times an Academy Award winner, is the producer and director of "Hemo the Magnificent." The stars are Dr. Frank Baxter, Richard Carlson—and Hemo, named after the Greek word for blood.

The Series is designed to help increase popular interest in science by dramatizing the great discoveries and advances that science has made. Greater public interest in science benefits the telephone industry and the country as a whole.

Make a note on your calendar to see "Hemo the Magnificent." Consult your local papers for time and station in your community.

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IN THE NATION'S CAPITAL

Concluded from page 19

would, in all probability, eventually seek to increase the excise "take," by boosting such taxes if they could.

Chairman Fountain now comes forward with some very persuasive arguments against transferring the telephone excise taxes to the states. It was prepared by his subcommittee staff. Representative Fountain said: "In effect, the federal government (as distinguished from the state governments) would give up approximately 148 million dollars or 150 million dollars in exchange for the termination of 82.5 million dollars in grants, with a net loss of (about) 62.5 million dollars to the United States Treasury, and yet . . . a large number of states would not obtain enough revenue to compensate for the federal grant's discontinuance."

The House subcommittee staff analysis indicated that the 10 "poorest" states—those with the lowest average per capita tax—would lose more than they would gain, if the proceeds from the telephone excises were switched from the federal to the state governments. The reason is that their loss of the corresponding contributions now made by the federal government in those states for vocational education and waste water filtration would far exceed what these "poorest" states would pick up from the telephone excise tax collections.

The staff report was prepared in answer to the proposal of the Federal-State Action Committee that these two federal spending programs—vocational education and waste water treatment facilities—should be turned over to the states, along with the right to collect 40 per cent of local telephone excise tax revenues.

Columbia U. Offers Utility Management Workshop

Applications are currently being accepted for Columbia University's Utility Management Workshop, to be held from July 27 to Aug. 8. It will be directed by Professor Robert T. Livingston, under the sponsorship of the Department of Industrial and Management Engineering. Now in its seventh year, the Workshop is designed specifically to meet the needs of executives in the public service industry and aims at the development of creative managers.

The 13-day course is organized so that participants work in small groups. Case discussion and actual problem-solving are supplemented with talks by management experts and social scientists.

This year the Workshop program concentrates on two areas: the Job of the Manager and the Development of Staff and Assistants, with talks to be given by Donald C. Power, president, General Telephone Corp., Kendrick Porter, management consultant; Dr. Daniel R. Davies, director of the Cooperative Center for Educational Administration, Teachers College, Columbia University; Dr. Chris Argyris, Yale University; Frederick G. Lippert, director of personnel administration, American Gas & Electric Co.; and Harllee Branch Jr., president, The Southern Co.

"Human Relations in Action" is the title of the panel of social scientists which will discuss actual problems and cases presented by Workshop participants. The specialists will outline suggestions for solution which can be applied to human relations problems as they are likely to turn up in day-to-day operations. This panel will consist of Dr. Lyman Bryson, chairman, Dr. Goodwin Watson, and Dr. Conrad M. Arensberg, all of Columbia University, and Dr. Walter D. Woodward, of American Cyanamid Co.

Participation in the Workshop is open to executives from middle and upper levels of management and is designed to develop resourcefulness and imaginative management in dealing with many different operative and public relations problems.

The fee for enrollment is $1,000 which covers board, lodging, and all books and materials used. Attendance is limited to 36.

Commission Approves Sale Of Michigan Independent

The Michigan Public Service Commission recently approved the purchase of the Peoples Mutual Telephone Co., Webberville, by the Rural Telephone Co. of Stockbridge.

The sale was completed on Feb. 21. The Rural Telephone Co., also operates exchanges at Stockbridge, Fitchburg, Gregory, and Munith.

Ga. Independent Asks Raise

The South Georgia Telephone Co., Sylvania, was scheduled to come before the Georgia Public Service Commission on Feb. 26 for a hearing on the company's petition for a rate in-

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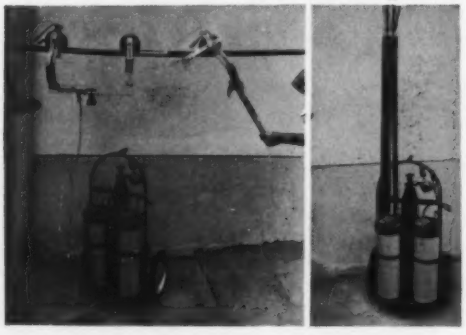

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Both models use highly successful chemical type leak detector. Applicator's dual nozzle sprays both sides of pressurized cable, giving 100% coverage. Bubble cluster forms around leak within minutes and can be clearly seen from the ground. Air pressure bottle in cart supplies regulated pressure in solution tank at all times, can be adjusted for different heights.

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crease. The company seeks permission to increase rates at its Folkston, Sylvania, Ludowici and Reidsville exchanges.

Nevada Company Appoints Geary Operations Manager

Walter T. Geary has been named general operations manager of the Southern Nevada Telephone Co., Las Vegas, by H. G. O. Weiler, president.

Mr. Geary spent several months in Las Vegas prior to and after the conversion of that exchange to automatic

W. T. GEARY

operation in 1954 when he was serving as field engineer for Kellogg Switchboard & Supply Co.

He has had more than 16 years experience in the telephone or allied industry. From 1941 to 1948, he was with Western Electric Co. in Kearney, N. J. He then joined General Telephone Co. of the Southwest in Texas where he served as chief equipment engineer until 1953, when he went with Kellogg as southwest switchboard sales and product planning manager.

In 1957, Mr. Geary moved to Universal Controls Corp. as product consultant and just prior to going to Las Vegas was manager of the installation department of Collins Radio Co. at Dallas. He was born on Staten Island in New York and received his engineering degree at Manhattan College in New York City.

Way to Better Service

"In the long run this business will make the most progress in the public interest—it will better serve the interests of customers, share owners, and employes alike—by raising the level of its earnings."—FREDERICK R. KAPPEL, *president, American Telephone & Telegraph Co.*

ELECTRIC PLANT NEWS

For keeping radio batteries charged . . .

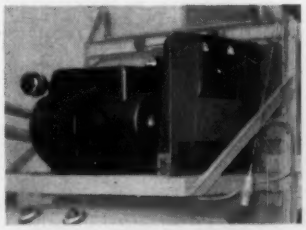
Truck-mounted Onan Electric Plant saves 6-10 gallons of gas per day!

Operates Onan Rectifier Battery Charger installed in truck body; delivers 2,000 watts A.C. for tools and lights

This 2KW Onan Plant, driven by a single-cylinder, air-cooled engine of 5 H.P. makes it unnecessary to run the 150 H.P. truck engine for battery charging. It saves gasoline and cuts down on truck engine maintenance. Savings of from $2.00 per day to $800.00 per year per truck have been reported. Moreover, the electric plant supplies 2 KW of *plug-in power* for electric saws, drills and lights used in construction and maintenance.

The installation above has the plant mounted over the truck cab. Other companies have installed units within the truck body. Onan air-cooled plants equipped with the optional, low-cost Vacu-Flo system *can be completely enclosed.*

There's an Onan Packaged Power system that can cut your costs substantially. Describe your need and let us help you.



ONAN MODEL 2LK-IRV shown with weatherproof steel housing removed. Mounting frame is attached to truck body. Plant is accessible for servicing. Entire unit can be transferred easily to new trucks. This plant is started electrically.

Special folder F-111 describes 3 Onan battery charging systems. Write or call.

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ABC OF THE TELEPHONE

Continued from page 30

or allowing it to slip. They also have been subjected to prolonged vibration tests with equally satisfactory results.

Wrapped Grip Dead-end. The wrapped grip type of dead-end consists of four or five high strength wires formed into a continuous spiral approximately 3 or 4 feet in length. The inside diameter of the spiral is slightly less than the outside diameter of the strand it is designed to hold.

The wrapped grip dead-end is inserted through the eye-bolt and around the thimble, if one is used, so that the center of the grip rests against the eye-bolt. Next, the grip is folded around to make it possible to wrap both free ends around the end of the strand. Layers of each of the free ends of the grip alternate along the wrap as it extends along the strand. See *Fig. 6* for a completed wrapped grip dead-end installation.

The spirals of wire tend to elongate as stress is placed on the strand. As the wrap elongates, the diameter of the spiralled wire is reduced. Thus, the completed wrap establishes a firm grip on the strand.

Dead-ends made with these grips have been tested under extreme load and vibration conditions and have proven satisfactory.

Attachment of Strand at Intermediate Poles. When the strand is dead-ended it is laid out along the pole line and raised to the three-bolt clamp installed on each pole. In many instances, the strand is paid out from a reel carried on a truck driven along the pole line right-of-way. If the strand would present a hazard while lying on the ground, it is raised into position as it comes off the reel on the truck.

Next the strand is placed in the three-bolt clamp and the clamp is partially tightened. The clamp bolts should be tightened enough to hold the strand in position, but not so tight that it will prevent the strand from sliding in the clamp. This operation continues until a number of spans of strand have been raised.

Tensioning the Strand. In this operation the strand is tensioned and clamped in place. As a rule, the strand is tensioned from a pole where head-guys are installed. The head-guy provides a firm support for the section of strand to be taken up. In some instances, the layout of the line, the location of corners or bends in the line, will determine the locations to be used to pull up the strand.

A number of tools are available to simplify the strand tensioning operation. Typical tools are lever-operated chain hoists, slack pullers, cable tensioning jacks, and block and tackle, or rope falls assemblies. These tools can be used to tighten 15 or 20 spans at a time from one location, if the run is straight and no obstructions are along the line.

The strand is pulled up to a uniform predetermined tension. Typical specifications call for placing 6M strand under a tension of 1,500 pounds. According to the same specifications, 10M strand would be tensioned at 3,000 pounds.

Another widely used set of specifications indicates the following tensions for the various strands, with all measurements taken at 60° Fahrenheit:

Strand	Tension in pounds
6M	1,100
10M	2,100
16M	3,600*

*For spans up to 250 feet. Spans over 250 feet are tensioned at 2,750 pounds.

Sometimes, a number of days may pass between the time a strand is placed and the cable is installed. Vibration fatigue, caused by ordinary cross-winds, may damage a strand where the tension has increased because of a drop in temperature. As a rule, this type of trouble will not occur unless the tension of the various strands has increased as follows:

6M—2,000 pounds
10M—3,000 pounds
16M—4,000 pounds

The vibrations of an unloaded strand, caused by a cross-wind, may not be readily visible to the eye. The strand is under tension—like a violin string. The vibrations are minute and rather high pitched—again like a violin string set in motion by a resined bow.

Vibration dampening may be necessary if a substantial drop in temperature occurs after the span is tensioned and before the cable is placed. A length of No. 14 twisted distribution wire can be placed at each pole to serve as a dampener (See *Fig. 7*). The wire is placed over the three-bolt clamp and wrapped around the strand for about 1½ or 2 feet in each direction from the strand. The ends of the wire should be tied in place on the strand. The presence of the wire on the strand tends to upset the free oscillation or movement of the strand. This retards

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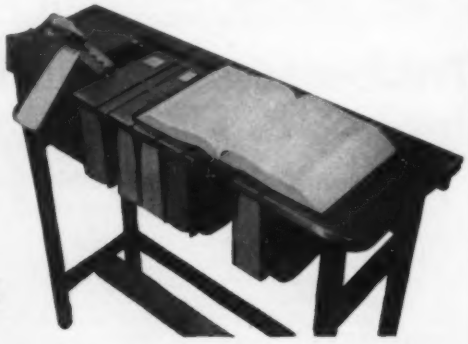

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or impedes the vibration waves that move from end to end on the span.

Span Tension Measurement. Span tension should be measured at the time of installation to be sure the strand is placed according to construction specifications. These measurements or checks should be made before the cable is placed.

The two methods most commonly used are measuring the tension with a strand dynamometer, or similar device, or checking the tension by counting the number of strand oscillations that occur in a given time interval.

Generally, a strand dynamometer is attached approximately at the midpoint of a section of strand being tensioned. These measurements may be taken adjacent to a pole. The length of the span in which the reading is taken has no bearing on the results of the test.

A typical dynamometer clamps over a section of strand allowing a center rod to rest against the wire. The center rod is linked to an indicator associated with a calibrated scale. As the rod is forced against the strand the indicator moves in accordance with the amount of strand deflection. The calibrated scale translates the amount of strand deflection to the tension of the strand in pounds.

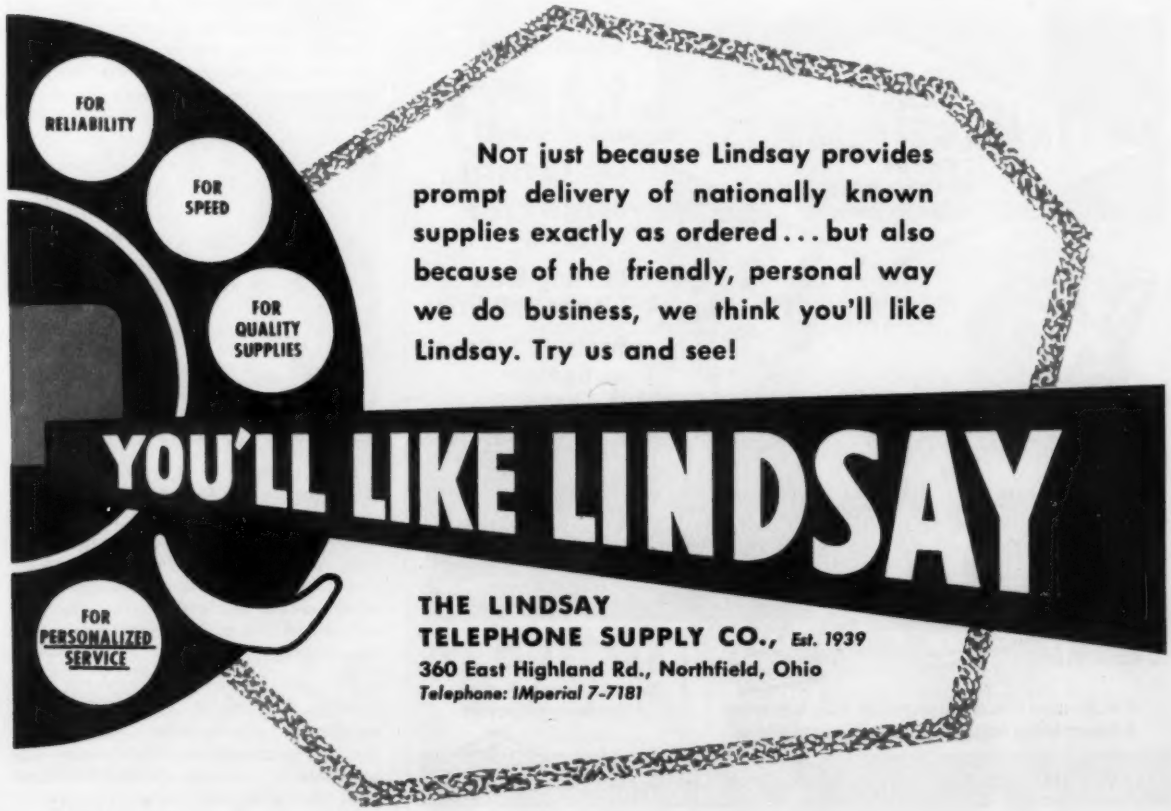
NUMBER OF OSCILLATIONS IN 15-SECOND INTERVAL FOR STRAND AT SPECIFIED TENSION

Size of Strand	6 M			10 M			16 M 3600 Lbs. or 2700 Lbs. Over 250 Feet		
Tension 60°F	1100 Lbs.			2100 Lbs.					
Temperature (F)	20°	60°	100°	20°	60°	100°	20°	60°	100°
Length of Span Feet									
100	33	30	25	41	37	33	38	35	33
125	26	24	20	33	30	26	31	28	26
150	22	20	17	27	25	22	26	23	22
175	19	17	14	23	21	19	22	20	19
200	16	15	13	20	19	16	19	18	16
225	14	13	11	18	17	14	17	16	14
250	13	12	10	16	15	13	15	14	13
275	12	11	9	15	13.5	12	14	13	12
300	11	10	8	13.5	12.5	11	13	13	12
325	10	9	7.5	12.5	11.5	10	12	12	11
350	9	8.5	7	11.5	10.5	9.5	11	11	10
400	8	7.5	6					10	9
450	7	6.5	5.5						

Table I

The oscillating method consists of oscillating the strand with a handline and counting the number of oscillations that occur in a 15-second interval. Aside from the handline all that is required is a watch with a second hand.

To make the oscillation test place a handline over the center of a clear span. The span should be free to vibrate without contacting any object,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such as a tree limb, which would interfere with its oscillation cycle. Also, the span should consist of a solid section of wire. A strand splice will tend to cause the spliced span to oscillate at a different rate than an unspliced span. As a result the indicated tension would be incorrect.

Next, observe the second hand of the watch held in one hand and hold the doubled handline in the other hand. Pull the handline down and let it return to set the strand in motion. The span is kept in motion by pulling and releasing the handline in sequence with the natural oscillation cycle of the strand.

When the pumping action of the handline is in cycle with the movement of the strand, count the number of cycles during a 15-second interval. Check span tension by referring to a strand oscillation chart similar to *Table 1*.

General of California Announces Changes

A major organizational change has been announced by General Telephone Co. of California, when Ernest W. Watson, general commercial manager, was appointed to the newly-created position of vice president in charge of merchandising, effective Mar. 1. Russell T. Grout, general commercial engineer will succeed Mr. Watson as general commercial manager, according to Edwin M. Blakeslee, president.

E. W. WATSON

Mr. Watson has been a member of General's staff since 1935. Prior to joining the company, he worked for The Pacific Telephone & Telegraph Co. in Los Angeles from 1922 to 1927. In 1930, he became a member of the Public Utilities Commission in San Francisco, where he was employed for four years.

A native Californian, Mr. Watson was born in Berkeley and attended Stanford University. During World War I, he served in the Navy as a Seaman First Class.

R. T. GROUT

Mr. Grout has been associated with the General company since 1936 when he became wire chief clerk in Long Beach. Four months later he was promoted to commercial representative and in 1938 transferred to the Santa Monica general office as a commercial assistant. In 1949, Mr. Grout assumed the managership of the company's West Los Angeles office. Three years later he transferred back to Santa Monica as general commercial engineer and has held that position until his current promotion.

Originally from Beaver Creek, Mich., Mr. Grout attended Macalester College in St. Paul, Minn. He further supplemented his education by attending the California College of Commerce in Long Beach.

IT&T Elects F. R. Furth A Vice President

Rear Adm. Frederick R. Furth, U.S.N. (Ret.), has been elected a vice president of International Telephone & Telegraph Corp., it was announced on Feb. 13 by Edmond H. Leavey, president, following a meeting of the board of directors. Admiral Furth is director of research and engineering for the corporation.

The admiral joined Farnsworth Electronics Division of IT&T as special assistant to the president in 1955, following his retirement. He became vice president of Farnsworth and in March 1957 was appointed deputy director of

REAR ADM. F. R. FURTH

research and development for IT&T, with headquarters in New York. He became director last July.

As chief of naval research in 1954 and 1955, Admiral Furth directed the expansion and use of new techniques in research of the upper atmosphere, permitting the Navy to move ahead rapidly with the technical portion of the earth-satellite program.

Admiral Furth, a native of Seattle, Wash., was graduated from the U. S. Naval Academy in 1924. He received post-graduate instruction in communications engineering at Yale University,

E. L. McKnight, purchasing agent of the Gulf States Telephone Co., Tyler, Tex., has joined a select circle of men who can claim 50 years of service to telephony. He has seen his organization, founded by Judge S. A. Lindsay at the turn of the century, become one of the leaders in the industry today. Still very much on the job, Mr. McKnight will undoubtedly be one of the men assisting at cut-over ceremonies when the Gulf States company achieves its goal of 100 per cent automatic dial operation system-wide.

World's Greatest Economy in Light Hauling!

Cushman 780 TRUCKSTER.

Are you plagued by the unhappy choice between the loss of time suffered by local servicemen on foot, and the expense of putting them in conventional vehicles?

The answer is the 780 Truckster, which already is being used in the telephone industry, at an amazingly low cost figure, for such jobs as servicing teletype installations and outside telephone booths.

Ruggedly built and driven by the powerful Cushman Husky 4-cycle engine, the 780 Truckster handles an 800 pound payload with ease —which means it can also be used for hauling supplies. It not only operates at a cost of less than a penny per mile, but requires a minimum of maintenance expense.

Because of its size and maneuverability, it also eliminates the hazards of parking in congested areas.

The 780 Truckster is available with fiber glass cab and side curtains as optional equipment, and in a variety of body styles to fit your specific requirements. Electric starter is also available.

Ask your dealer for a FREE demonstration or write for new booklet

SOLD AND SERVICED NATIONALLY
Replacement parts available immediately

CUSHMAN MOTOR WORKS, INC.
A subsidiary of Outboard Marine Corporation
934 No. 21st, Lincoln, Nebr.
Please send complete information on 780 Truckster
NAME _____
ADDRESS _____
CITY _____ STATE _____

from which he received a master of science degree.

One of two naval members of the U. S. Radar Mission to the United Kingdom during World War II, he was awarded the Order of the British Empire (Honorary Officer). The Navy awarded the admiral the Legion of Merit for his wartime contributions to the development of radio, radar, sonar and other electronic equipment. He was promoted to the rank of rear admiral July 1, 1953, while serving as assistant chief of the Bureau of Ships for electronics.

Admiral Furth is a past president of the American Society of Naval Engineers, a member of the Society of Naval Architects and Marine Engineers; Associate Fellow, Institute of Aeronautical Sciences; Fellow, American Society for the Advancement of Science; Scientific Research Society of America; Naval Order of the United States; national president, Armed Forces Communications Electronics Association, and senior member, Institute of Radio Engineers.

North Names T. W. Parsons To Defense Products Staff

Lt. Col. Theodore W. Parsons (ret.) has been appointed to the Defense Products Activities Staff of Hans Kraepelien, president of North Electric Co., Galion, O.

LT. COL. T. W. PARSONS

Colonel Parsons joined North immediately after retirement on Jan. 1 following 23 years active service with the Army Signal Corps. He retired from the post of assistant deputy for procurement, USASSA, Philadelphia, Pa., a position he had held for the past six years.

Three years prior to his service with USASSA, Colonel Parsons was assigned to the U. S. Forces Antilles, San Juan, Puerto Rico, as Signal Officer.

During World War II, Colonel Parsons served with Headquarters, Eighth United States Army in New Guinea, Leyte, the Philippine Islands and Japan as Assistant Army Signal Officer.

North Electric, a member of the Ericsson Group, in 1958 will signalize 75 years experience in the manufacture of telephone equipment and automatic control systems and related components.

National Pneumatic Acquires Conn. Telephone & Electric

Richard H. Frost, president, National Pneumatic Co., Inc., announces the acquisition of Connecticut Telephone & Electric Corp. of Meriden, Conn., manufacturers of telephone and electronic equipment.

Mr. Frost, who has been elected chairman of the board of Connecticut Telephone & Electric stated, "The acquisition is part of an overall plan of expansion of the National Pneumatic Co. into related fields."

Theodore Frost, Westport, Conn., has been elected president of Connecticut Telephone & Electric; Robb W. James, executive vice president of National Pneumatic Co., will serve as executive vice president of Connecticut Telephone & Electric, and be in charge of operations at Meriden; Harry Cox, comptroller of National Pneumatic, has been elected treasurer of Connecticut Telephone & Electric.

This is the third acquisition in recent years by the National Pneumatic Co. In 1949 the Holtzer-Cabot Electric Co., Boston, Mass., manufacturers of instrument motors and telephone ringing equipment, was acquired, and in 1953 Bright Star Industries, Clifton, N. J., manufacturers of dry batteries and flashlights, was acquired.

Graybar Promotes Three In Cincinnati District

Graybar Electric Co. has announced the following appointments in Cincinnate district personnel:

L. A. Russ has been appointed operating manager at Evansville, effective on Feb. 24.

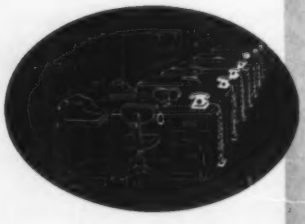
Effective on Mar. 10, C. J. Fiely takes over as operating manager at Louisville.

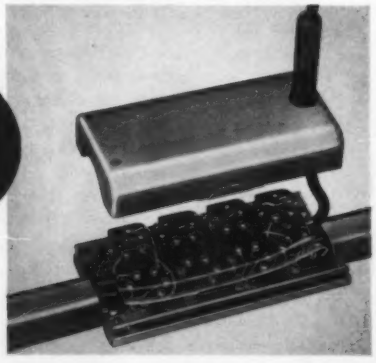
W. J. Hewitt has been appointed supervisor at Lexington, Ky., effective Mar. 17.

Evaluation Of Gratitude

"What makes false reckoning as regards gratitude, is that the pride of the giver and the receiver cannot agree as to the value of the benefit."—La Rochefoucauld.

at last! a low cost MULTIPLE TERMINAL BOX for Planned Telephone Systems





Designed to accept as many as four type 44 terminal blocks, Wiremold's new 2644T Multiple Terminal Box permits Planned Telephone Systems *without attaching fittings to office furniture.* Installation is easy—no new tricks or special equipment are needed. It can be hooked up to any overfloor system—and it's used with underfloor systems as well.

For a trip proof cable system, 2600 Pancake® is the flattest overfloor duct made. It's strong as a bridge, and easy to install with a few simple fittings.

Wiremold developed the first single terminal box for overfloor applications, and again is first with the multiple terminal box. For full information about these Wiremold developments, write:

THE WIREMOLD® COMPANY
HARTFORD 10, CONNECTICUT

a proved and accepted circuit element used in hundreds of

TELEPHONE APPLICATIONS

A
FAST
RELIABLE
SENSITIVE
VERSATILE

POLARIZED RELAY

by

DIAPHLEX
A Division of
COOK ELECTRIC COMPANY
Chicago Illinois U.S.A.

write for our new Catalog:

"RELAYS BY DIAPHLEX"

with over 225 standard adjustments listed that are interchangeable with, and cross referenced to the WE-280 code number.

COOK ELECTRIC Company
Since 1937

2700 SOUTHPORT AVENUE CHICAGO 14, ILLINOIS

KLEIN

Whether it's tool belts or safety straps . . . pliers or wrenches . . . grips or climbers, linemen and electricians know they can expect the highest in quality when their equipment carries the name Klein.

For more than a century Klein has been the leader in designing and producing tools and equipment to serve the exacting needs of the utility field.

Today, wherever power lines or communication lines are strung, Klein tools and equipment are in greater demand than ever, assuring safer, speedier line construction and operation.

WRITE FOR FREE TOOL GUIDE
A free copy of the new Klein Pocket Tool Guide will be sent on request.

ASK YOUR SUPPLIER
Foreign Distributor: International Standard Electric Corp., New York

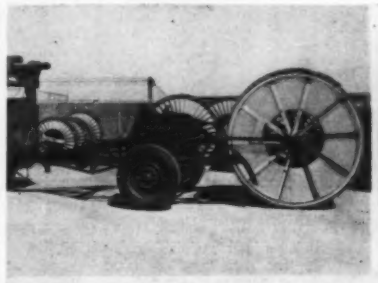
Mathias KLEIN & Sons
Established 1857 — Chicago, Ill., U.S.A.
3300 McCORMICK ROAD • CHICAGO 45 ILLINOIS

News on New Products

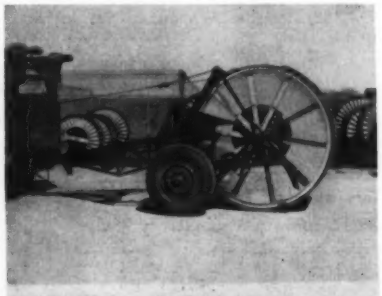
CABLE TRAILER CONVERSION KIT—Tel-E-Lect Products, Inc., has introduced a new "Reel-Safe" trailer conversion kit for handling large cable spools.

Designed to accommodate reels up to 90 inch diameter and weights to 5 tons, "Reel-Safe" combines loading and unloading ease with safety features to make cable handling a safe and simple operation, the company reports.

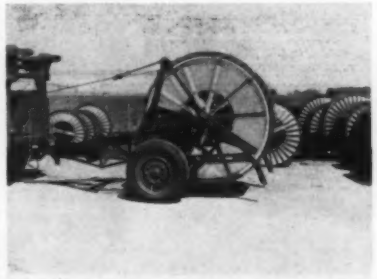
Adaptable for any PWD, PCP, W-PCP or similar trailer, the kit features two-minute loading or unloading by two men, according to the manufacturer. The trailer is backed into position, an axle bar inserted through the spool, and the truck's winch line is hooked to a draw bar ring. As power is applied, the reel rolls forward and the axle bar engages rails on either side of the trailer which guide it up into the loaded position. These rails also prevent the trailer from tipping back. When the reel is fully raised, it is secured by lock pins placed through both rails behind the reel's axle bar. Tension is then released on the winch line and the rig is ready to travel. Request NP827.



1. Back trailer to reel, insert axle bar through right link and spool. Slip left link on other end.



2. Fasten winch line hook to draw bar ring.



3. Apply power to winch so that reel comes up tightly into place.

4. Insert locks through rails behind axle bar to secure for travel.

TELEPHONY PUBLISHING CORP.
608 S. Dearborn St.
Chicago 5, Ill.

Please have the manufacturer send me without obligation the literature indicated by the following numbers:

NP827_____; NP828_____; NP829_____; NP830_____;
NP831_____; NP832_____; NP833_____; NP834_____;
NP835_____.

Name . . . . . Title . . . . .

Company . . . . .

Street . . . . .

Town and State . . . . .

3/8/58

PRESSURIZED CABLE SYSTEMS

The need for an automatic device to stand guard at intervals along pressurized cables has long been recognized. Now United Electric Controls has the answer . . . The Telephone Cable PRESSURE-GUARD.

Developed by U.E., in collaboration with the Bell System, the PRESSURE-GUARD is now available to all Telephone Companies as an aid in reducing cable maintenance costs.

In the past the location of a cable leak was a matter of man hours in climbing poles and manually checking pressure points. When the pressure guard detects a pressure drop it introduces an electrical resistance . . . which indicates at a central monitoring source a cable leak and the location.

Specifications Pressure-Guard

Field Adjustment Range	0 to 15 PSI
Factory Setting	2 ±¼ PSI on falling pressure
Pressure Response	4 ±½ oz.
Proof Pressure	30 PSI
Electric Rating	0.01 amp 110V DC
Load Resistor	Carbon composition 330,000 OHM 1 watt
Take-Off Tube	Tinned Copper 6′ x ¼″ x 0.035
Drop Wire	6′ Type SJ0 #18 stranded 0.2 conductor
Size	6″ x 4½″ x 2½″
Approximate Weight	1¾ lbs.

These specifications may be modified in a great variety of ways to meet the requirements of any given application.

UNITED ELECTRIC *manufactures a complete line of temperature, pressure, and vacuum controls. For applications requiring custom-built units or modified standard units, call upon a UE application engineer for recommendations. Write for complete specification and pricing data on the Telephone Cable Pressure-Guard. Similar data available on all other UE controls.*

UE® United Electric Controls COMPANY
85 SCHOOL STREET, WATERTOWN, MASS

To prevent pole and power line leaning...

guy with

CF&I GALVANIZED STEEL STRAND

High in Quality. CF&I carefully controls every stage of production, from the making of the steel through the drawing, galvanizing and stranding of the wire.

Readily Available. CF&I three- and seven-strand constructions can be promptly shipped to strategically-located distributors throughout the country.

Long-Lasting. Extreme care in cleaning and galvanizing produces a heavy, tightly-bonded coating of pure zinc to provide maximum protection against corrosion.

Safe. CF&I Strand meets or exceeds ASTM Specifications A-122 or A-363; or can be made to customer specifications.

Easy to Work. CF&I Strand is extremely ductile. It handles easily and helps linemen do better installation jobs.

Next time you need strand—for guy wire, messenger wire or overhead ground wire—be sure to investigate the advantages of CF&I Galvanized Steel Strand. Your nearby CF&I representative or local electrical distributor will give you full details. 5734

CF&I GALVANIZED STEEL STRAND
THE COLORADO FUEL AND IRON CORPORATION

Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Chicago Denver • Detroit • El Paso • Fort Worth • Houston • Kansas City • Lincoln (Neb.) • Los Angeles • New Orleans • New York • Oakland • Oklahoma City • Philadelphia • Phoenix Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita

POWDER-ACTUATED TOOL—A new powder-actuated fastening tool, which stops an overdriven fastener in its tracks, thereby eliminating the danger of firing through a thin work surface, has been introduced by Ramset Fastening System. Ramset is part of Olin Mathieson Chemical Corp.

Called "Flite-Chek," the tool will enable many companies, where restrictions have limited the use of powder-actuated tools, to materially lower their fastening costs while speeding fastening work, James J. Clarke, Ramset sales manager, said.

Control of the fastener is accomplished by a new assembly whose tapered interceptor jaws prevent the passage of an overpowered fastener or one that encounters a soft or thin spot in the work surface. The fastener is stopped before it leaves the tool. When the fastener is stopped in this manner, the operator simply pulls the tool off the work and is ready for another fastening. There is no damage to the tool.

Flite-Chek operates much the same as other Ramset powder-actuated tools. A pull of the trigger seats a special fastener into a wide variety of non-brittle material. The tool is capable of sinking a fastener into as much as an inch of steel.

The arresting device in the new tool is completely automatic and in no way slows down its operation. It is simple to use, Mr. Clarke noted, and there is no necessity to thread the stud into or out of the piston-like device called a flight brake. Flite-Chek is designed for threaded studs, he added.

In addition to preventing the escape of fasteners, the company lists these features for the Flite-Chek.

(1) Its loading cycle is twice as fast as that of comparable equipment. With this tool a worker can set more than 150 fasteners an hour.

(2) Surface damage (spall) is reduced in concrete applications.

(3) The tool eliminates the hazard of overdriving into unknown material.

(4) It is simple to operate. Training for Flite-Chek is the same as for other Ramset fastening tools.

(5) An overdrive will not damage the tool.

(6) It can be used in comparatively small openings.

Special fixtures and locating devices can be designed for Flite-Chek upon request, Mr. Clarke reported.

The new tool uses ¼-inch fasteners with special plastic tips. Request NP828.

•

TRENCHER—The Arps Corp. announces the development of a new, one-man operated trencher—the Trench-Devil, Model Jr. The compact new trencher is suitable for telephone installations and similar light trenching jobs.

One man can transport the Trench-Devil to the job site, easily unload it from a truck, complete the work at

hand, and load the unit unaided. It digs a trench 2¾ inches wide, up to 20 inches deep. At the 20 inch depth, digging speed averages 6 feet per minute; a 12 inch depth increases digging speed to 15 feet a minute.

To operate the Trench-Devil, the operator merely pulls out a cable wound around a winch drum on the machine, hooks the cable to a stake inserted in the ground at the required distance behind the trencher and lowers the boom to the desired depth, then locks it in position. Turning a hand crank at the top of the unit winds the cable on the winch, pulling the entire unit along the correct direction of travel.

Important features of the trencher, according to the manufacturer, include: Cutters made of high carbon, heat treated steel; ball bearings utilized at all points of high speed or heavy load, sealed to keep out dirt; and a protective shroud to shield the operator and engine from flying dirt.

An optional accessory is a curb attachment for digging inside of concrete curbings. When using this attachment the trencher's wheels are adjustable to 8 inches below normal, keeping the unit level at varying curb heights. This optional feature, the company claims, is ideal for utilities laying cable just inside the curb line, or when digging alongside a hillside. Request NP829.

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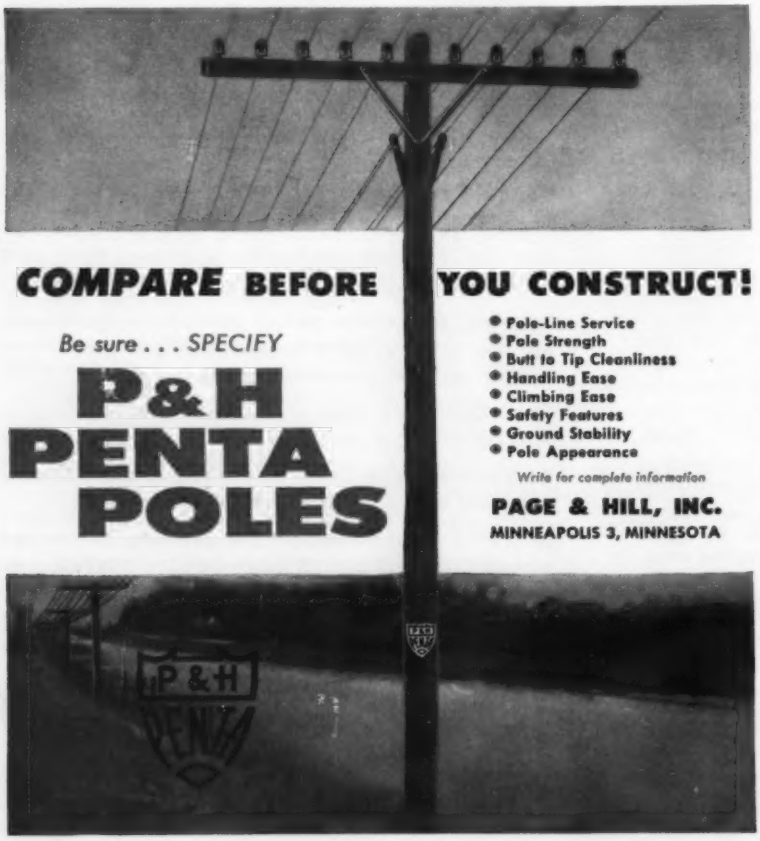
SPIRALLY-CUT WIRING TUBE TOOL—Cable-Former, a "wiring tool" is the latest addition to Panduit Co.'s



ROEBLING PAPER-LEAD TELEPHONE CABLE

Available in conductor sizes 19, 22, 24 AWG . . . 6 to 909 pairs. Paper-taped conductors, with 1% antimony-lead sheath. Additional protective coverings for special requirements.

ROEBLING PLASTIC TELEPHONE CABLE

Conductor sizes 19, 22, 24 AWG . . . from 6 to 404 pairs. Light weight permits smaller messengers, longer spans. Conductors are polyethylene-insulated; sheath is high-molecular-weight polyethylene.

For **"Fair Weather"** service– even when blizzards take over... **Roebling Telephone Cable!**

Get free fact books on Roebling Plastic Telephone Cable and Roebling Paper-Lead Telephone Cable from Kellogg Switchboard and Supply Company. Or write, Electrical Wire Division, John A. Roebling's Sons Corporation, Trenton 2, N. J.

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

TELE-MUFF Jr.

The Head Set Ear Cushion
Designed Especially for Switchboard Operators

Made of Soft Pliable Vinyl Foam

- **Easy on Ear**
- **Inexpensive**
- **Attractive**

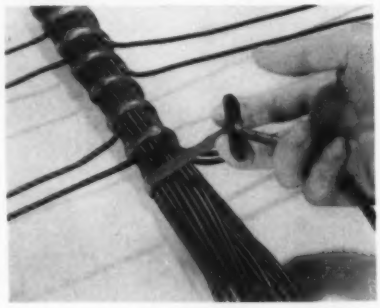
Write for Details

Thanks for your splendid response. All orders being shipped promptly.

TELE-MUFF CO.
Box 832
San Fernando, Calif.

line of electrical wiring components. The new tool is designed for use with the company's wiring tube, a spirally-cut, non-flammable polyethylene cable lacing.

The Cable-Former is a small plastic blank with a center slot approximating



the cross section of the flexible wiring tube. In actual use, it is threaded over one end of the tube, then wound around the bunched wires to form a neat, compact cable. As the tool is moved along the length of the wires, it "unwinds" the tightly formed spiral tube and wraps it over the wires with uniform pressure. This makes a secure free-running cable—flexible, yet firmly held.

The wiring tube will secure any number of wires in cables from ¼ inch to 4 inches in diameter. It follows the path of the wires easily, making it especially useful in electronic equipment and in control panel installations where door hinge cables or isolated runs are necessary. Because it is re-usable, it is also highly economical for the temporary circuits encountered in the control industry and in the construction industry. Wires may enter or leave the cable at any point. Spiral wiring tube is also easily removable for revisions and trouble shooting.

Polyethylene construction gives excellent service over a wide temperature range. Non-flammability, lightweight, good insulating properties and resistance to chemical attack assure long trouble-free performance.

Panduit spirally-cut wiring tube is available in 100 and 1,000-foot lengths. A Cable-Former tool is supplied with each order at no additional cost. Request NP830.

•

PANEL BOARD CLEANER—Finger prints, excess rosin or soldering flux, or grease and oils, left on printed circuit panel boards after assembly of the parts, can be removed quickly and easily by immersing the parts in a "Freon" fluorinated solvent or a mixture of the "Freon" and ethyl alcohol, according to E. I. Du Pont de Nemours & Co.

Only two minutes treatment is required, Du Pont tests show, and the fluorinated solvent does not affect either the panel base or colors used for coding electronic parts of the printed circuit, as do other commonly used solvents. Best combination of solvents, the company says, is one composed of 60 per cent by weight "Freon"-TF and 40 per cent of a suitable denatured anhydrous ethanol.

An additional advantage of the "Freon" solvent in such applications, Du Pont's "Freon" Products Division pointed out, rests in its ability to reduce the flash point of the flammable alcohol. "Freon" itself is non-flammable, non-explosive, and virtually non-toxic. Request NP831.

•

INTERLOCKING CUTTER MASONRY DRILLS—An interlocking cutter is now to be found exclusively in Tilden auger point drills.

Made of sintered tungsten carbide, and molded specifically for masonry drilling, this cutter insures a strong drill, and will stand a high degree of heat, minimizing the need for coolants.

Another major improvement introduced is the use of more carbide where it is needed, thus making possible many

TELEPHONE AND TELEGRAPH EQUIPMENT

Radio Engineering Products is currently producing a number of types of equipment, electrically and mechanically interchangeable with standard Bell System apparatus.

CARRIER-TELEPHONE EQUIPMENT

C5 Carrier-Telephone Terminal (J68756). A kit for adding a fourth toll-grade channel to existing C systems is available. • C1 Carrier-Telephone Repeater (J68757) • 121A C Carrier Line Filter • H Carrier Line Filter (X66217C).

CARRIER-TELEGRAPH EQUIPMENT

40C1 Carrier-Telegraph Channel Terminal (J70047C) • 140A1 Carrier Supply (J70036A1, etc.) • 40AC1 Carrier-Telegraph Terminal.

VOICE-FREQUENCY EQUIPMENT

V1 Telephone Repeater (J68368F) • Power Supply (J68638A1) • V1 Amplifiers (J68635E2 and J68635A2) • V3 Amplifier (J68649A) • V-F Ringers (J68602, etc.) • Four Wire Terminating Set (J68625G1) • 1C Volume Limiter (J68736C).

D-C TELEGRAPH EQUIPMENT

16B1 Telegraph Repeater (J70037B) • 10E1 Telegraph Repeater (J70021A) • 128B2 Teletypewriter Subscriber Set (J70027A).

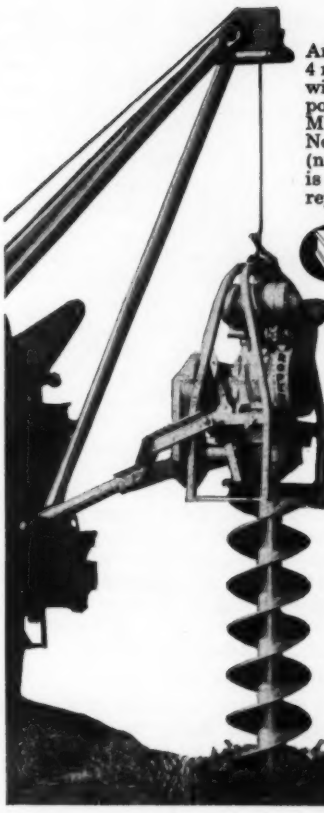
TEST EQUIPMENT

2A Toll Test Unit (X63699A) • 12B, 13A, 30A (J64030A) and 32A (J64032A) Transmission Measuring Sets • 111A2 Relay Test Panel (J66118E) • 118C2 Telegraph Transmission Measuring Set (J70069K) • 163A2 Test Unit (J70045B) • 163C1 Test Unit (J70045D).

COMPONENTS AND ACCESSORIES

255A and 209FG Polar Relays • Repeating and Retard Coils, several types • 184, 185, 230A and 230B Jack Mountings.

RADIO ENGINEERING PRODUCTS
1080 UNIVERSITY ST., MONTREAL 3, CANADA
TELEPHONE UNiversity 6-6887
CABLES RADENPRO MONTREAL



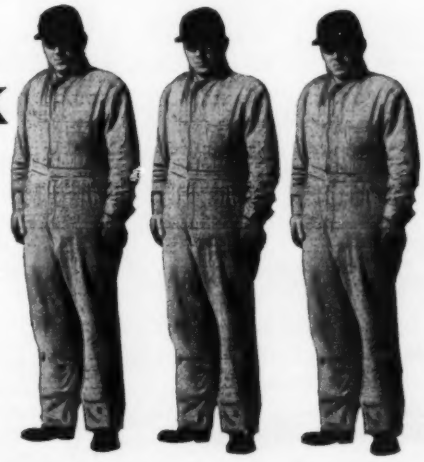
An Ohio contractor reports it used to take 4 men to dig in hard dry dirt or soft rock with a competitive digger operating from power take-off equipment. The EXTRA MEN were needed to ride the digger. Now, with a Roper automatic hole digger (no PTO needed) on the job only one man is needed for guidance, not for brawn. The report continues "I have dug 29 pole holes 14" in diameter 5 feet deep in only 3 hours with my Roper."

If you're looking for the fastest, most dependable digger on the market, check the Roper. It digs a straight or angle hole from any truck, jeep or tractor equipped with front or rear boom and winch. Prices and specs on request. Write today.

Standard unit depth 6 ft. Maximum digging depth 25 ft.

ROPER Roper Manufacturing Company 250 Elm St., Zanesville, Ohio

SAVES THE WORK OF 3 MEN DIGS 29 HOLES IN 3 HOURS



Ask your Graybar representative about the Roper automatic hole digger!

A Directory for the Virginia Telephone & Telegraph Company

Printed by

R. R. DONNELLEY & SONS COMPANY

350 East Twenty-second Street, Chicago 16

PAGE LASHING WIRE OF Stainless Steel

You get a neat and long-lasting job every time you use PAGE Stainless Steel Lashing Wire! Ideal for lashing conductor cables (lead or neoprene covered) to a strand messenger by Neale or Western Electric Machine. Coils tailored to fit machine specified.

3 GRADES • EACH IN 2 SIZES (.065 and .045)

Type 430 • for use with galvanized messengers
Type 302 • for use with stainless messengers
Type 316 • for use under severe corrosion conditions

Furnished six coils in cardboard carton (minimum order).

Other fine-quality products • You can depend upon PAGE Strand (Stainless or Galvanized Steel) and PAGE Stainless Dead-End Wire • See your Telephone Supply Distributor, or write our Monessen, Pa., office.

Page Steel and Wire Division
AMERICAN CHAIN & CABLE

ACCO

Monessen, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Bridgeport, Conn.

Straight Neoprene-Jacketed Instrument Cords with twisted or parallel inners.

Nylon Operators' Cords and Switchboard Cords, with or without Plugs

Neoprene Handset Cords with Moulded Strain Reliefs

Neoprene-Jacketed Retractable Cords

It's a fact! . . . COMMERCIAL *is* headquarters for one of the most complete and diversified lines of cords available today . . . guaranteeing highest quality and prompt service to meet your every requirement. Remember this whenever you need good cords in a hurry.

Write for Catalog, Samples and Prices.

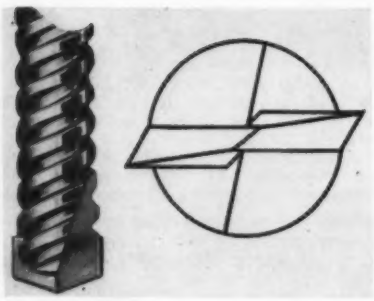
P.S. Commercial Instrument Cords are now available in color!

COMMERCIAL CORD AND SUPPLY CO., INC.

CLIFTON SPRINGS, N. Y.

Phone: HOward 2-5111

QUALITY CORDS FOR ALL MAKES AND TYPES OF TELEPHONE INSTRUMENTS



more sharpenings, prolonging the life of the drill.

Tilden auger point drills featuring this new interlocking design are available in sizes ¼ inch through ½ inch. Request NP832.

•

CONDUIT BENDER—A new type portable automatic bender for smaller sizes of conduit has been announced by Chamor Mfg. Corp.

Accurate 90 degree bends can be made as rapidly as two a minute; 1,000 in an eight-hour working day. The machine also can make offsets, doglegs and other special bends.

The bending is accomplished by a lever arm pushing the conduit upward against a bending head. A rotary gear reducing assembly operates the lever arm at a speed of 3 rpm. Power is

supplied by a 1/3 hp, 1700 rpm, totally enclosed motor. A weatherproof housing encloses a reversing switch and a thermal overload switch for motor protection. The machine has an automatic stop for the 90 degree bend.

A reversing switch is used when making offsets and doglegs. The conduit is inserted, the necessary bend made, and the head marked at the number of degrees of bend. Moving the conduit forward, it is turned over and the reverse bend made to the same point. The bends are automatically accurate and parallel, making a perfect offset.

The same bending shoe handles ½-inch, ¾-inch or 1-inch conduit. A very simple and fast adjustment is made in the clamp support to change sizes. Shoes are changed only when special radii are required. Shoes are available for 3-inch and 4½-inch radii for ½-inch and ¾-inch conduit, and a 5-inch radius for ½-inch, ¾-inch and 1-inch conduit.

Mounted on two wheels the unit rolls as easily as a wheelbarrow. The weight is balanced so that a minimum of physical effort is required to move the bender. With most of the parts made of aluminum, total weight is only 150 pounds. Since the bending is done by internal pressure in the machine itself, no laborious fastening or anchoring is required. Request NP833.

•

TELEPHONE LIST FINDER IN COLOR—the Bates "Director," a new telephone list finder, color styled to match new telephone colors, has been introduced by The Bates Mfg. Co.

Designed to catch the eye of the contemporary home owner or the office executive who prefers modern decor, the Director has been color styled to match 10 telephone colors: Brown, gray, ivory, beige, yellow, red, blue, green, white and pink.

The feature of this new list finder is its artistically new cover design that makes it a bright conversation piece in

ON THE JOB ...for you

the modern or contemporary home or office.

Bates engineers have developed a wide front opening release which automatically lifts the top when it is touched. The extra-wide cards allow for more than 1,300 names and telephone numbers.

Bates complete line of list finders includes 35 different models. Request NP834.

•

POISON IVY IMMUNIZER—An immunizer, Oral Ivy, which comes in a one-ounce bottle, enough to last a whole season, to "take the itch out of ivy poisoning"—one of the chief causes of lost manhours—has been introduced by Milderm Research Laboratories.

Mass industrial tests over the last four years show that preventive treatment started six weeks before men might be exposed to poison ivy, oak or sumac, gives 75 to 90 per cent protection from the painful affliction.

The immunizing treatment has been mass tested by medical and safety directors on tree service workers known to be subject to ivy poisoning whose work takes them constantly into areas where exposure is common. It also has been clinically tested by physicians with private patients who suffer annually from the skin poisoning. Industrial reports show the treatment is effective in 75 to 90 per cent of the cases—clinical reports show 70 per cent or more of the private cases were benefited.

It is so free of side effects and so safe to use that it has been given to prevent ivy poisoning among child campers, Boy Scouts, Girl Scouts and other children likely to be exposed to the plants, the laboratories report.

Safety and medical departments in industry this year are issuing the one-ounce season-supply of Oral-Ivy to outdoor workers such as tree service men, telephone linemen, and others.

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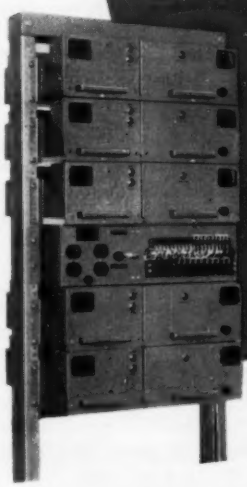

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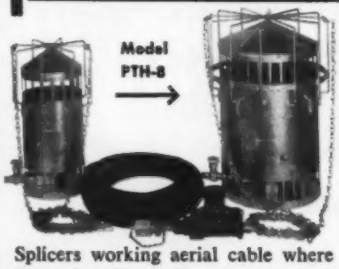

Splicers working aerial cable where "bare hand" efficiency is a "must" in all weather like the fast, dependable action of MoPeCo tent heaters. The 8,000 BTU model furnishes about 50 hours heat at maximum level from one 20 lb. propane tank. Two 4' chains instantly adjust height with snap hooks. Unit comes with low pressure regulator and 30' L.P. gas hose.

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In industrial use, safety and medical directors recommend that men start taking the immunizer at least six weeks before they expect to be exposed to poison plants. They take five drops of Oral-Ivy daily in water, milk or fruit juice before breakfast during this pre-exposure immunity build-up period. Then, through the rest of the poison ivy season they take the same does three times a week to maintain their immunity.

Lewis E. Miller of Milderm Laboratories, the man who developed Oral-Ivy, reports on a mass testing project conducted by one tree service firm over a four-year period—1954 through 1957 seasons. All of the men given the immunizer had suffered with ivy poisoning in previous years. Of those taking the immunizing drops, 50.8 per cent reported no ivy poisoning at all. Only 2.8 per cent reported severe ivy poisoning while 80.8 per cent reported definite improvement. An example of men who reported improvement—in addition to those who had no attacks—would be men who usually suffered severe attacks who, after taking the immunizer, reported only mild itching from exposure to the poison plants. Request NP835.

Rex Names Representatives For New York City Area

The appointment of two sales representatives for the New York City and Long Island area has been announced by The Rex Corp., West Acton, Mass., manufacturers of insulated wires and cables, Rexolite UHF insulation and

J. J. O'KEEFE

other electronic products. These representatives are James J. O'Keefe Jr., associated with Rex since 1951 as New England representative, inside sales service & specification, and Edward J.

E. J. Mc INTYRE

Mc Intyre, serving Rex since 1952 in various capacities including sales engineer for New England and who recently acted as field supervisor for Rex's sales trainee program. Both men will be working out of Rex's New York office which is located at: 152 West 42nd Street, New York, N. Y.

As sales representative for Rex, Mr. O'Keefe will cover the Westchester County and Long Island area.

Mr. Mc Intyre will cover metropolitan New York and Northern New Jersey, representing Rex's electronic and telephone products. He gained previous experience as sales representative in the New York area while associated with another wire manufacturer, and additional experience in purchasing and standards engineering for an electronic manufacturer in New England prior to his association with The Rex Corp.

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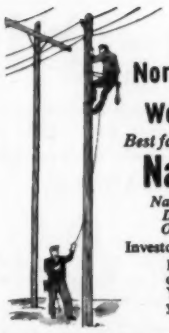

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